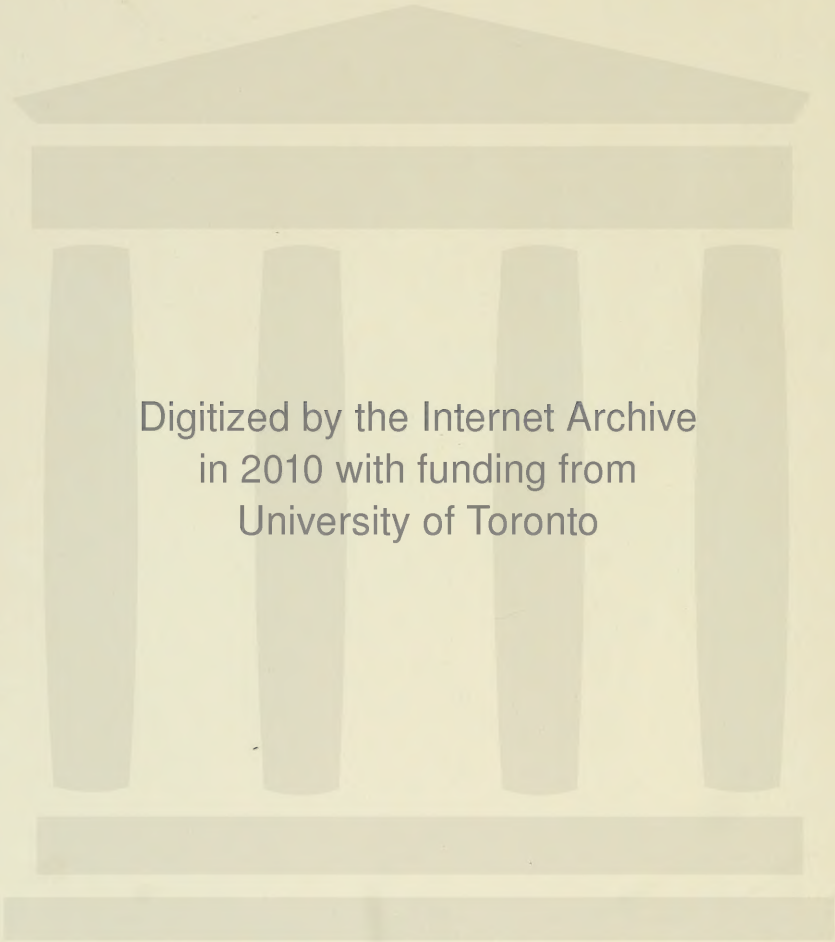

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XIII. **MONTREAL, JULY 1, 1915** **No. 13**

A Good Meeting

The Technical Section of the Canadian Pulp and Paper Association is successfully launched. The full import of this statement may not be thoroughly grasped by those who did not attend the first regular meeting held in Montreal, June 19. But to those in attendance, it is merely the confirmation of a conviction which was graven deeply on their minds.

About forty delegates were present, some of them having come hundreds of miles to the gathering. The papers which were delivered were of the very highest order. It is the privilege of the "Pulp and Paper Magazine" to publish these in this issue, but it is only fair to say that the reading of the text does not give the same pleasure that was to be derived from hearing the speakers in the course of their addresses. The sentiment was universal that if the class of papers given to the Section at this meeting can be maintained, there can be no doubt whatever as to the success and full usefulness of the Section.

The papers of Dr. Bates and Mr. Lee of the Forest Products Laboratories, are worthy of a place in the proceedings of a scientific society of the very highest scholarship. The same may be said of Mr. Taylor's paper, the only difference being that his subject dealt with problems of a purely practical and applied nature. But the discussion, both in the meeting hall, and in the conversation of the delegates, served to crystallize more than anything else, perhaps, the thought of many on problems which they have had in mind.

Perhaps the suggestion of one prominent member of the Section that the real way to start the Section was "to lock the members up in a good hotel for a week" states the main truth of the value of the Section. There will be developed a strong spirit of fellowship, and of practical co-operation, which will place the industry on a higher basis than ever before. Out of this fellowship and co-operation should ultimately come the development of the technical side of the pulp and paper industry, until papermaking becomes more a profession than a trade, and the fine technical skill of pulp and paper engineers will be coupled with an insight into the problems of the industry which will be a definite uplift to all who are devoting their lives to this work.

There were at least two definite suggestions emanating from this meeting, which should prove a stimulus and an advantage to all. It is a pleasure to give credit where credit is due. Our good friend Mr. C. B. Thorne, of Hawkesbury, suggests that before the next annual meeting of the Section, there be prepared an exhibition of all classes of pulp and paper manufactured in the Dominion. Every mill will be urged to contribute a specimen of every one of its manufactures, and these should be placed in such a way that the whole industry may see what Canada is really doing in pulp and paper. The suggestion is further made than every mill send a sufficient quantity of each class of paper to make it possible for every member of the Section to have in his possession a complete set of Canadian-made papers.

At the close of the discussion on Wood Room Procedure, Mr. Thorne, (as will be noted in the report in the succeeding pages), made another suggestion which shows to advantage the value of the Technical Section. He said in effect that altogether too much money is being wasted by firms experimenting on various classes of appliances and of methods all are arriving at more or less satisfactory results. Would it not be a distinct saving to the industry in general, he asked, if the members of the Technical Section, who are most closely in touch with these problems, should form good strong committees for the investigation of processes, machinery, etc., and report their findings to the whole body? In this way time and money would be saved, and the progress of the industry be placed on more scientific lines and rendered more stable.

The question of standards and testing of pulp and paper products is going to be a large one. Dr. Bates, the Chairman of the Section, will before long appoint committees on this and other matters, such as Technical Education, and Literature and Statistics. The value of such enterprises is at once apparent.

We sincerely hope that the high note which was struck at this meeting may be maintained throughout the future gatherings. Under such circumstances, the pulp and paper industry will take great strides forward.

The One Great Problem

"Ye have the poor always with you" said the Great Teacher nineteen hundred years ago. So far as history shows us, and so far certainly as modern conditions indicate the statement has never been called into question. The poor are certainly with us in 1915. The one great cause of the unhappiness, misery, vice and crime in this world is the poverty of people—the fact that a very large majority of the inhabitants of the globe are daily face to face with the grim problem of getting enough to eat, drink and be clothed with.

Why should the poor be poor? Are so many millions of people too indolent to work? Or are they unfortunate? Or do they constitutionally lack the physical and mental powers to secure anything more than bare existence?

Obviously the affirmative answer to any or all of these would not explain poverty as it exists today.

In so far as it is bound up with unemployment the Ontario Labor Educational Association whose interests lie with the "working man" (we sincerely hope they would not exclude any from the category) state in a recent solution of their body that "employment is inherently a product of our present industrial system. . . . It affects the works locally, provincially, nationally and internationally."

In nineteen hundred and fifteen one of our most enlightened and conscientious bodies therefore virtually describes unemployment as a disease of society—a "product of our present industrial system." Their opinion fits in well with that of a national religious assembly which in a recent resolution went on record as believing poverty a social crime."

And is it not enormous, is it not hideous, is it not fearful—the fact that "practical men" as we like to call ourselves allow this monster of poverty to prey upon the health and happiness of society?

Nor do modern improvements help us from the difficulty—No, we are as poor as ever we were. One great economist says: "Unpleasant as it may be to admit it it is at least becoming evident that the enormous increase in productive power which has marked the present century and is still going on with accelerating ratio has no tendency to extirpate poverty or to lighten the burdens of those compelled to toil. It simply widens the gulf between Dives and Lazarus, makes the struggle for existence more intense. The march of invention has clothed mankind with powers of which a century ago the boldest imagination would not have dreamed. But in factories where labour-saving machinery has reached its most wonderful development little children are at work; wherever the new forces are anything like fully utilized, large classes are maintained by charity or live on the verge of recourse to it; amid the greatest accumulations of wealth men die of starvation, and puny infants suckle dry breasts; while everywhere the greed of gain, the worship of wealth shows the force of the fear of want."

Who will answer the challenge of the times? who will take from the groaning world the scourge of poverty? why should it not be the business man, the manufacturer, the man who deals with practical problems?

The Ontario Labor Educational Association has called upon the Government "to immediately appoint a committee to bring down such recommendations as they deem necessary to relieve the conditions of unemployment entirely."

Mr. Papermaker, Mr. Engineer, Mr. Business Man, how would you advise our Government?

French Remove Duty

Word comes from France that the Chamber of Deputies, which had, on the proposal of the Commissioner of Customs, approved a mandate reducing by 60 per cent the duty of 10 francs ($2.00) on newsprint coming from foreign countries, and on cellulose pulp from which newsprint is made in France, has adopted the resolution of M. Ringuier to abolish entirely the duty. The question which was brought before the Deputies on the 20th May gave rise to a long discussion, in which vigorous arguments were put forward by the paper industry and by the newspaper publishers.

MEETING OF TECHNICAL SECTION IN MONTREAL

SUCCESSFUL GATHERING HELD JUNE 19, 1915

The first regular meeting of the Technical Section of the Canadian Pulp and Paper Association, was held in Montreal on Saturday, June 19th. Instead of going to the Chemistry Building of McGill University, as had been suggested, the delegates assembled, at the invitation of Dr. J. S. Bates, in the spacious library of the Forest Products Laboratories, where members could be in more companionable conditions. When Dr. Bates as president, took the chair, there were present about twenty-five delegates. At latter sessions this number was augmented, and the final registration showed the following gentlemen in attendance:

List of men attending the meeting of the Technical Section of Canadian Pulp and Paper Association, at Montreal, June 19th, 1915:—

J. S. Bates, Forest Products Laboratories of Canada, Montreal.

H. E. Bell, E. B. Eddy Co., Ltd., Montreal.

E. Bertie, Superintendent, Rolland Paper Co., Ltd., St. Jerome, Que.

J. B. Beveridge, Manager, Dryden Timber and Power Co., Ltd., Dryden, Ont.

A. O. Bowness, Chemist, E. B. Eddy Co., Ltd., Hull, Que.

O. F. Bryant, Forest Products Laboratories of Canada, Montreal.

C. F. Buss, Superintendent, St. Lawrence Paper Mills Co., Ltd., Mille Roches, Ont.

Paul E. Buss, St. Lawrence Paper Mills Co., Ltd., Mille Roches, Ont.

Roy Campbell, Secretary, Canadian Pulp and Paper Association, Montreal.

A. B. Cooper, Forest Products Laboratories of Canada, Montreal.

T. L. Crossley, Chemical Engineer, J. T. Donald and Co., Montreal.

A. E. Cuzner, 256 First Avenue, Ottawa, Ont.

R. M. DeCew, Forest Products Laboratories of Canada, Montreal.

J. A. DeCew, Chemical Engineer, 211 McGill St., Montreal.

G. W. Dickson, Superintendent, Groundwood Mill, Laurentide Co., Ltd., Grand Mere, Que.

W. Gorman, Provincial Paper Mills Co., Ltd.

R. W. Hovey, Forest Products Laboratories of Canada, Montreal.

Prof. H. O. Keay, McGill University, Montreal.

R. M. Kenny, The Jas. MacLaren Co., Ltd., Buckingham, Que.

J. F. Kenny, The Jas. MacLaren Co., Ltd., Buckingham, Que.

W. L. Ketchen, Riordon Pulp and Paper Co., Ltd., Hawkesbury, Ont.

H. N. Lee, Forest Products Laboratories of Canada, Montreal.

P. J. Murer, Riordon Pulp and Paper Co., Ltd., Hawkesbury, Ont.

A. G. McIntyre, Manager, Pulp and Paper Division, Bathurst Lumber Co., Ltd., Bathurst, N.B.

J. L. McNicol, Forest Products Laboratories of Canada, Montreal.

William F. Norton, Canadian Leatherboard Co., Ltd., Chambly Canton, Que.

S. Norman, Riordon Pulp and Paper Co., Ltd., Hawkesbury, Ont.

T. Y. O'Neill, E. B. Eddy Co., Ltd., Montreal.

H. A. Radford, Process Engineers Limited, Montreal.

S. Rodier, Rolland Paper Co., Ltd., St. Jerome, Que.

Henri Rolland, Rolland Paper Co., Ltd., St. Jerome, Que.

Rolland, J. P., Rolland Paper Co., Ltd., St. Jerome, Que.

Olivier Rolland, Rolland Paper Co., Ltd., St. Jerome, Que.

E. B. Slack, Chemist, Riordan Pulp and Paper Co., Ltd., Hawkesbury, Ont.

John Stadler, Engineer, Belgo-Canadian Pulp and Paper Co., Ltd., Shawinigan Falls, Que.

H. S. Taylor, Engineer, Spanish River Pulp and Paper Mills, Ltd., Sault Ste. Marie, Ont.

C. B. Thorne, Engineer, Riordon Pulp and Paper Co., Ltd., Hawkesbury, Ont.

Sigmund Wang, Riordon Pulp and Paper Co., Ltd., Hawkesbury, Ont.

Herbert C. Wells, Canadian Leatherboard Co., Ltd., Chambly Canton, Que.

The secretary read the minutes of the first meeting, which were approved. Then followed the minutes of the Executive Council held in Montreal on March 5th. The President urged those assembled to criticize fully the Constitution which had been drawn up by the Council, but after a discussion the original draft, with a few minor changes suggested by the President, was approved. The Constitution of the Section stands, therefore, as follows:

The Technical Section is provided for under Article 14 of the Constitution of the Canadian Pulp and Paper Association. This Section is an organization of individuals apart from the activities of the parent Association. The Section will have its own Constitution and By-laws, which will harmonize with the principles of the Canadian Pulp and Paper Association.

Article I. Name. This Organization shall be called "Technical Section of the Canadian Pulp and Paper Association."

Article II. Objects.—The objects of the section shall be to stimulate interest in the science of pulp and paper making in Canada, to provide means for the interchange of ideas among its members and to encourage original investigation.

Article III. Membership.—There shall be two classes of members: (1) Members—entitled to vote; (2) Associate members—not entitled to vote.

1. **Qualification for Members.**—Any person who occupies or has occupied an executive technical position in the pulp and paper industry; anyone occupying a subordinate position in the pulp and paper industry who has had a satisfactory technical education; anyone who, though not having had a technical education, has special qualifications and experience.

2. **Qualifications for Associate Member.**—Any person who will support and assist the aims of the Technical Section, and who, by virtue of his qualifications, is likely to further the work of the Section. These members may attend all official meetings of the Section and have the right to take part in discussions.

Note 1.—Any Associate Member, who in the opinion of the Council satisfies the requirements of Class 1, may become a voting member.

Article IV. Election of Members.—Each candidate for membership shall be proposed and seconded by members of the Technical Section, and shall be voted on by the Council of the Technical Section, a majority of whose votes shall be necessary for election. The Council shall also decide as to which class of membership the candidate is entitled.

Article V. Dues.—The annual dues for voting members shall be three dollars, and the annual dues for associate members, two dollars, payable at the beginning of the calendar year. A member who has not paid at the end of the year is suspended.

Article VI. Officers and Council.—The officers shall be a Chairman and a Vice-Chairman elected for one year by the members of the Technical Section at the annual meeting; and a Secretary-Treasurer who shall be the regular Secretary of The Canadian Pulp and Paper Association.

The Chairman and Vice-Chairman with three Councillors elected from the Technical Section shall constitute the Council of the Technical Section. The present Council shall serve for one year, at the end of which time three Councillors (in adition to Chairman and Vice-Chairman) shall be elected as follows: One to retire at the end of one year, one to retire at the end of two years, one to retire at the end of three years, and thereafter one to retire every year, and one to be elected in his place to serve for three years. Retiring members of the Council (other than Chairman and Vice-Chairman) are not eligible to re-election as Councillors for one year, although they shall be eligible for the office of Chairman or Vice-Chairman. It is desirable that the Chairman, Vice-Chairman, and three Councillors be chosen to represent the various branches of the industry, viz., book and writing, news and wrapping, chemical pulp, mechanical pulp, board and miscellaneous.

The Chairman, Vice-Chairman and Secretary-Treasurer shall perform the usual duties of these offices. The Council as a whole shall pass on membership, attend to business between meetings and have general charge and control of the affairs of the Technical Section.

Article VII. Meetings.—The Technical Section shall hold at least three meetings annually, if possible. The annual meeting for the election of officers shall be held at the time of the annual meeting of The Canadian Pulp and Paper Association. Two additional meetings may be held as determined by the Council. Upon the invitation of a member of the Council, non-technical members may be admitted to the meetings of the Technical Section. Meetings are to be called in writing, and every member is to receive due notice of any meeting with a programme of what is to take place.

The proceedings of the Technical Section, upon the approval of the Council, may be inserted in the official journal of the Section.

Article VIII. Amendments.—The constitution may be amended by the members present at any regular meeting of the Association by a two-thirds vote of the members present, provided that such amendment shall be submitted to the members in a printed or written notice at least thirty days before such meeting.

This article may be suspended, however, by a unanimous vote of the members present.

The recommendations of the Council regarding the adoption of the "Pulp and Paper Magazine of Canada" as official journal of the Section, editorial committee, etc., were approved.

The appointment of committees on Literature and Statistics, Standards and Methods of Testing, Technical Education, and for the collection of paper samples, was left to the Chairman.

In connection with the work on standards and methods, some delegates pointed out that the field would prove a very large one, and that great pains should be taken to make the foundations firm, and the investigations authoritative.

It was generally agreed that there should be an effort made to hold a meeting in October or November.

The delegates then made a tour of inspection of the Forest Products Laboratories. They saw the timber testing equipment, in which mine props, and all forms of structural timber are tested for strength in various machines, and took in also the lay-out of the administration building of the Laboratories, with the offices of the technical staff.

But the main item of interest was of course, the paper mill, which is situated practically adjoining the Administraton building, and contains one of the best experimental outfits extant today. The plant is housed in a brick and stone building 90 ft. by 30 ft. The equipment consists of one double Marx beater 60 lbs. capacity, one single Marx beater 40 lbs. capacity, both beaters having interchangeable steel and stone rolls, one Noble and Wood baby Jordan, and an Erfurt Sizing System, donated by Process Engineers, Ltd., Montreal. The paper Machine (a picture of which is to be seen on a succeeding page) was made by Pusey and Jones. The wire is 25 ft. long, and 33 ins wide, the paper trimming 30 ins. There are two stone press rolls, and twenty 15 in. driers, and one 5 ft. Yankee drier. The machine has a smoothing press, and is equipped for top sizing. Any speed from 15 to 150 ft. per minute may be attained, but the speed usually run is 50 ft. per minute.

There will be installed shortly a couple of experimental digesters, which will give facilities for experiments on chemical pulp.

Mr. O. F. Bryant, who is a graduate of the University of New Hampshire, and has had extensive experience in many points in America, including the Nekoosa-Edwards plant at Port Edwards, Wis., is in charge of the pulp and paper investigations. Mr. J. L. McNicol, well-known to Canadian papermakers for his knowledge of conditions in Great Britain and in various plants in Canada, is in charge of the machine operations in the paper mill.

The fourth run of paper which has been put over the machine was on while the delegates were in attendance. They had an opportunity of seeing what the machine would do.

In the afternoon the delegates assembled to hear papers by Mr. H. N. Lee, and Dr. J. S. Bates, of the Forest Products Laboratories, and Mr. H. S. Taylor, of the Spanish River Pulp and Paper Mills, Ltd. On the conclusion of the papers and the discussion, the majority of the delegates adjourned to the St. Regis Hotel, where a most pleasant evening was held around the festive board. At an irreproachable hour, the gathering dispersed, bringing to a close a most successful meeting.

STRUCTURE OF WOOD AND SOME OTHER FIBRES AS RELATED TO PULP AND PAPER

By H. N. LEE, M.A.

Botanist Forest Products Laboratories of Canada

Paper Delivered before the Technical Section of the Canadian Pulp and Paper Association, Montreal, June 19th, 1915

Part I.

Structure of Spruce as a typical coniferous wood; comparative structure of Poplar as a dicotyledonous wood; a brief description of herbaceous dicotyledonous and monocotyledonous plant structure.

Beginning with the structure of coniferous woods we may take Spruce as a typical example. Figure 1 shows at a magnification of thirty diameters some carefully separated single fibres of Spruce wood. Each fibre consists of a hollow tube, actually about 3 m.m. or one-eighth of an inch long, with closed and more or less pointed ends. The walls of the fibre vary in thickness as is illustrated in Figure 2. If you consider a great number of these fibres placed parallel to each other and end to end the condition of the

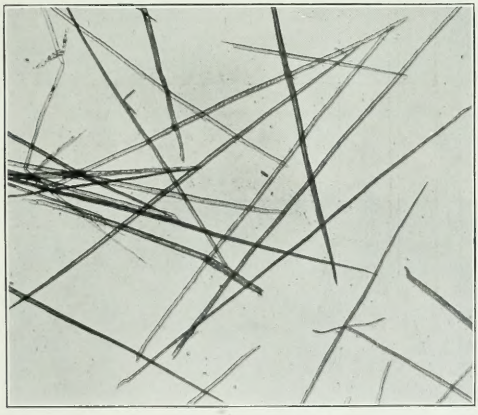


Fig. 1.—Spruce Fibre × 20.

fibres in the wood is obtained and when this is cut across transversely one sees a view as represented in Figure 2. The figure shows one complete year's growth or actual ring, in which the larger, thinner-walled fibres are those formed in the spring, while the smaller thicker-walled fibres are formed in the summer growth. The dark lines extending in a parallel manner across the figure are the rays. Several resin canals show scattered through the section, appearing as little open spots surrounded by a rim of darker cells, these latter being the elements which actually secrete the resin. Ahe fibres generally contain resin only when, as after wounding, a great abundance of it is formed. Looking at a section cut longitudinally along the plane of the rays we get in a view as seen in Figure 3. The fibres, of course, extend lengthwise and, since the slice of wood is very thin, the fibres are usually seen only in section. In some places the face view of the fibre appears and then little circular spots, known as the bordered pits, and which are characteristic of coniferous fibres, occur. The rays appear as little collections of cells running in the direction per-

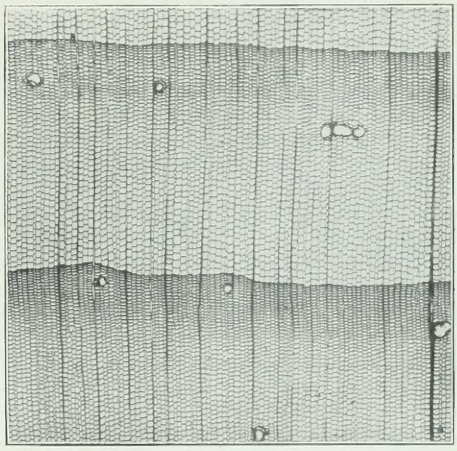


Fig. 2.—Spruce Wood, transverse section × 30.

pendicular to the fibres. A resin canal also shows in the lower left hand side of the figure running parallel to the fibres. The thin walls and wide openings of the spring fibres are in marked contrast to the thick walls

Fig. 3.—Spruce Wood, radial section × 30.

and narrow openings in the summer fibres. In the longitudinal section of the wood cut tangentially, that is, at right angles to the rays (Figure 4) the fibres of course extend lengthwise. In this view we also see the little rows of cells one above each other which make up the rays and one can easily see that they do not occupy more than ten per cent of the total volume of the wood. The heavy dark lower part of the figure is the summer wood, while the lighter upper part is spring wood, the section having been cut slightly obliquely so as to include both.

The fibres of the latter on the same scale of magnification as those of the spruce are much shorter, though in some cases broader than the spruce fibre. (Figure 5.) The narrower ones are the true fibres, while the broader are the vessels or pores. In the wood these are arranged longitudinally, and appear as seen in Figure 6 in transverse section. The vessels are the larger openings scattered evenly throughout the figure, and the fibres fill the spaces between, while the rays show as wavy parallel lines extending from the lower to the upper part of the figure, the same as in the spruce.

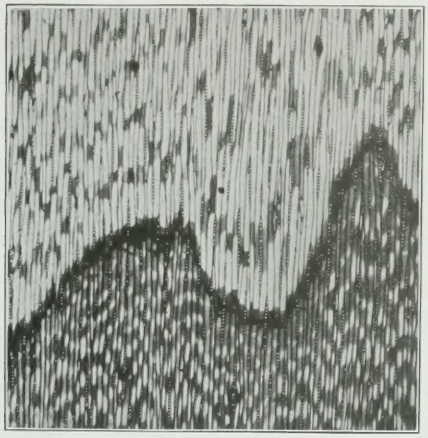


Fig. 4.—Spruce Wood, tangential section × 30.

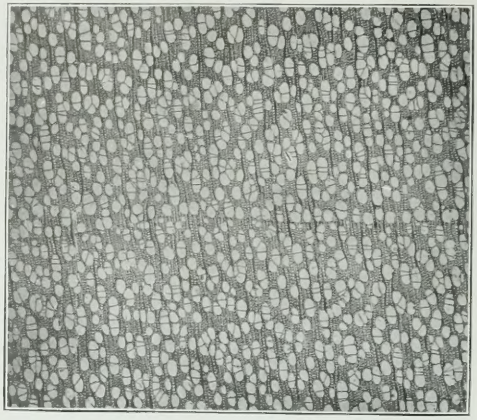


Fig. 6.—Poplar Wood, transverse section × 25.

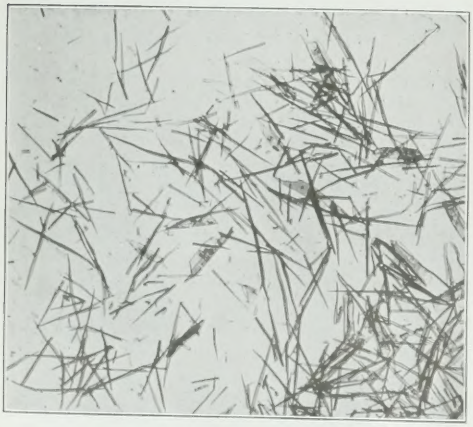


Fig. 5.—Poplar Fibre, × 20.

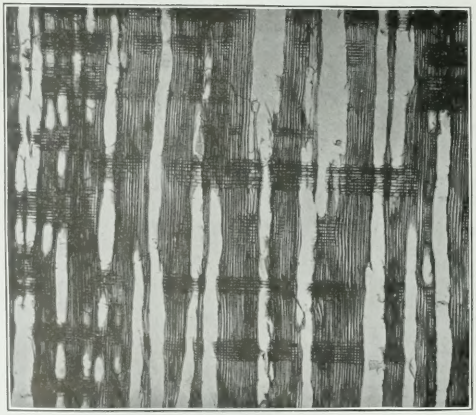


Fig. 7.—Poplar Wood, radial section × 25.

In function the fibres both transport sap up and down and mechanically support the tree as a whole, while the rays serve to conduct sap horizontally and to store food substances. In structure and function other coniferous woods are in a general way like Spruce, but all of this class of woods differ greatly from the woods of the broad-leaved class.

The radial section (Figure 7), shows the vessels through which the sap travels, placed end to end to form long open tubes. The very narrow fibres fill in between the vessels and the rays show running at right angles to them. The fibres do not transport sap as do those of the Spruce, but only give the necessary support to hold the tree erect while the rays serve the same

functions as those of the conifers. The tangential section (Figure 8) shows again the pores and fibres arranged longitudinally while the rays, of course, are seen in end view.

As well as wood there are two other types of plants important as sources of paper making fibres. Figure 9 is a transverse section of Clematis as a representative

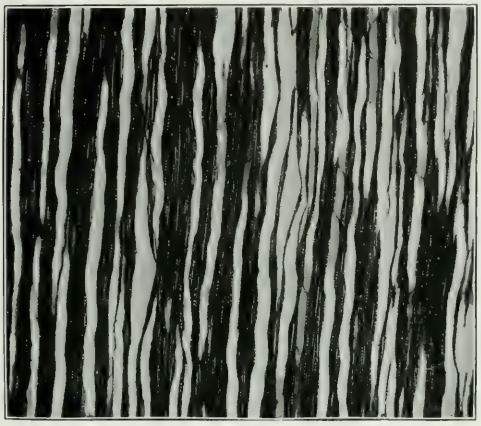


Fig. 8.—Poplar Wood, tangential section · 25.

of the herbaceous dicotyledonous class of which flax as the source of linen and jute are members. The stem in this plant, like many others of the group, is hollow and the solid part consists largely of thin-walled, wide, short cells; the bast fibres which are often very long, and which are the important cells, from a paper making

Fig. 9.—Clematis stem, transverse section · 16.

standpoint, being located only in the circle of dark bundles of elements located just inside the periphery. The other great group of plants which is very important in paper making is that to which the grasses and cereals belong. Esparto, Hemp, Straw, Indian Corn and Sugar Cane, are included in this group in which, as is shown by the transverse section of a piece of a stalk of Indian Corn (Figure 10) the darker groups of cells in which the long bast fibres are located are not found restricted to a single circle, but are scattered throughout the whole stem. The space around the bundles of cells, which included the fibres is filled with thin-walled, short pith cells which are of little value in paper mak-

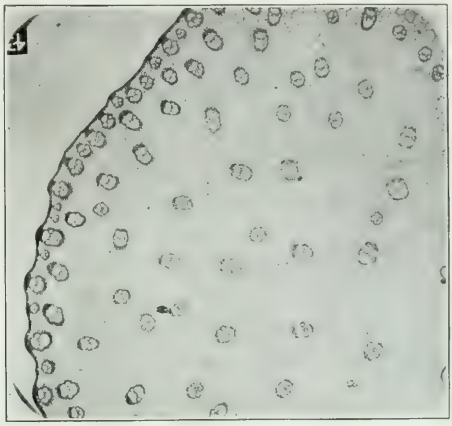


Fig. 10.—Indian Corn stem, transverse section · 16.

ing. Comparing the transverse section of either of the woods with these two last examples it will quickly be noticed that in wood all, or most of the cells, are long and usable for good pulp, while in the two latter types only a small portion of the stem consists of long, strong fibres.

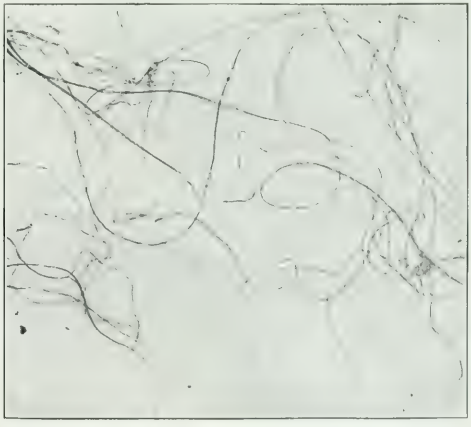


Fig. 11.—Cotton Fibre · 25.

Part II.

The second part has three divisions, namely: the shape and size of various wood and other fibres; the comparative dimensions of fibre from very young trees, medium aged and old wood, together with branches and roots; a comparison of groundwood and sulphite.

Figure 1 of Spruce fibre may be taken as an example to represent the general dimensions of coniferous fibre, such as are obtained from Balsam Fir, Hemlock, Tamarack, Jack Pine and other conifers, for although the fibre from the latter trees may be very different from that of Spruce in other properties, the size and shape is much the same. It would not be exact to say they are just the same since the length of fibre from fir and some others is less than that of spruce, while certain

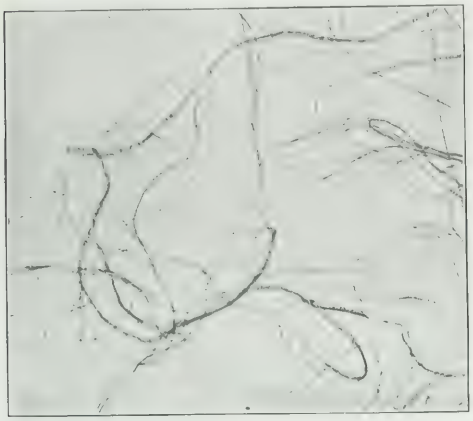


Fig. 12.—Flax Fibre · 25.

trees such as the Southern Pine, yield a fibre which may average to be very nearly twice the length of that of spruce. The fibres are not originally round or flattened, but square to hexagonal and average about .03 m.m. in diameter. The shape in cross section as well as the variation in width and in thickness of the walls has already been illustrated in Figure 2. While some chemical change may take place in the transformation from sapwood to heartwood there is no difference in the shape and size of the fibres of the two parts.

The next size figures are all reproduced on the same scale of magnification which is slightly greater than that of Figures 1 and 5. In Figure 11 of Cotton the flattened and twisted appearance is due to the fact that the cotton fibre is very thin-walled and easily collapses. A cotton fibre averages to be at least ten times as long as a Spruce fibre, but like most others which are so long, is usually cut up in papermaking. Flax fibre (Figure 12) is nearly as long as Cotton, but since it has a much heavier wall, does not so readily collapse to give a flattened twisted appearance. Moreover, the little joints which occur irregularly in Flax fibre distinguish it from Cotton. It might be well to call attention to the fact that according to Bulletin 593 of the Department of Trade and Commerce, one million tons of Flax straw are burnt in Canada every year, because here Flax is raised for its seed only. Figure 12 was prepared from a sample of Flax straw sent to the Forest Products Laboratories with a request for advice as to how it might be used. It seems as if the Flax could be utilized in some way in papermaking. Esparto, as seen in Figure 13, has a very short, straight, sharp-pointed, narrow fibre, very different from Cotton or Flax. A single piece of sulphite lying across the upper part of the figure shows how much smaller is the Esparto fibre than that of Sulphite.

Of the many different kinds of hemp, which vary in length from two or three times up to ten times the length of Spruce fibre, Figure 14 of Manilla is an example. Manilla and Sisal have smooth walls, while some of the other hemps have joints like those of flax. Indian corn, sugar cane, banana and common straws of various kinds have a great variety of cells, the most important of which are the long bast fibres averaging about twice the length of Spruce cellulose. Figure 15 of Oat straw shows the short, wide pith cells as well as the much longer and narrower bast fibres. Jute (Figure 16) has a heavy, smooth-walled fibre which makes it valuable for papers requiring great strength. The sample shown came from a cement bag.

The dimensions of fibres from young, medium aged and old wood and of branches and roots will be next considered. Two curves shown in Figure 17, made from fibre measurements of two trees of Douglas Fir, represent graphically the very short fibre of the first formed wood, perhaps averaging 1 m.m. in length; the rapid increase in length which reaches a maximum at an age of 50 or more years, and the slow decrease in fibre length as the trees grows old. Compared with the fibres of the main trunk those of the branches are much shorter, while the root fibres, though longer than those occurring in the branches, are much thinner walled and somewhat shorter than those of the main stem.

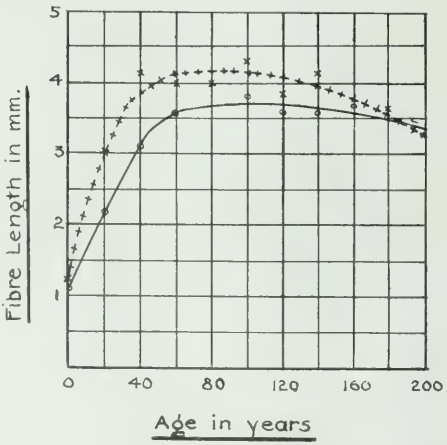


Fig. 17.—Two curves showing the length of fibre according to age in years in two trees of Douglas Fir.

Figures 18 and 19 illustrate the marked difference between Sulphite and Groundwood. While some of the single fibres occur in Groundwood, in many cases the fibres are torn off in short ragged bundles, while in thers they are ground up into very small particles. Sulphite, on the other hand, shows the fibres entirely separated and usually much twisted and flattened, so that except for their pointed ends and bordered pits they may resemble short pieces of cotton, especially after beating.

Fig. 13.—Esparto Fibre × 25.

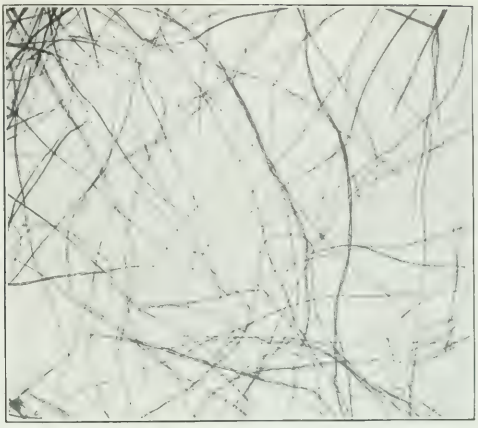


Fig. 14.—Manilla Hemp Fibre × 25.

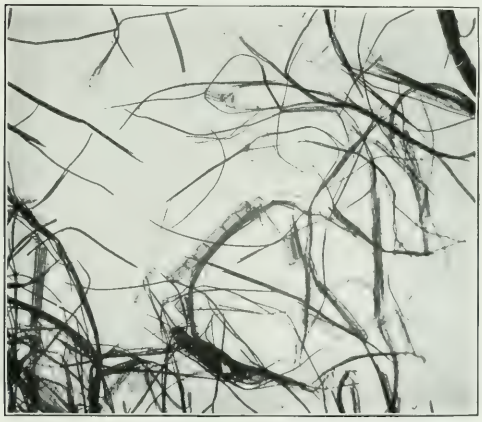


Fig. 15.—Oat Straw Fibre × 25.

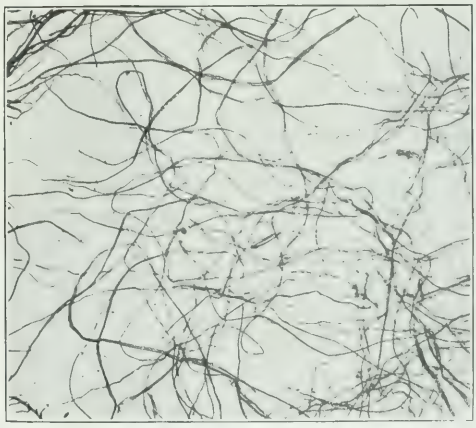


Fig. 16.—Jute Fibre × 25.

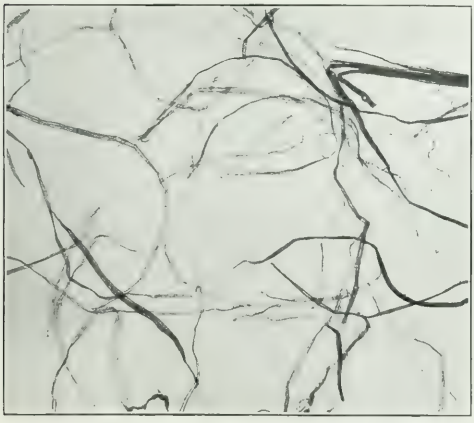


Fig. 18.—Spruce Sulphite Pulp × 25.

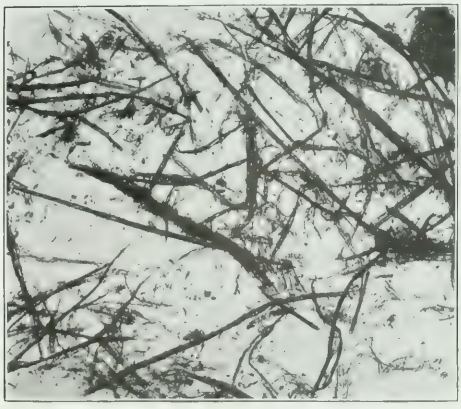


Fig. 19.—Spruce Ground Wood × 25.

Part III.

The last part of this paper consists of some notes on means of identification, especially of common wood fibres. Recognition of fibres other than those from woody plants, and the distinguishing of chemical from mechanical pulp is best carried out by micro-chemical methods. Figure 20 is a table of the reactions of common fibres with chlorzinciodide, which is the reagent of most general value.

Micro-Chemical Reactions of Fibres.

Fibres.	Chloration Produced. Chlorzinciodide Solution.
Cotton, Linen, Hemp.	Wine-red.
Esparto, Straw, Celluloses	Blue to violet, or blue to greyish violet.
Sulphite.	Blue to bluish violet.
Manilla Hemp.	Dark yellow or greenish yellow.
Mechanical wood pulp, jute.	Yellow.
Unbleached Manilla, straw (partially boiled).	Yellow.

Fig. 20.

For examination, the paper is broken up into pulp by boiling with a weak solution of caustic soda, is then thoroughly washed and the fibres carefully separated out on a glass slide with needles. Before treating with

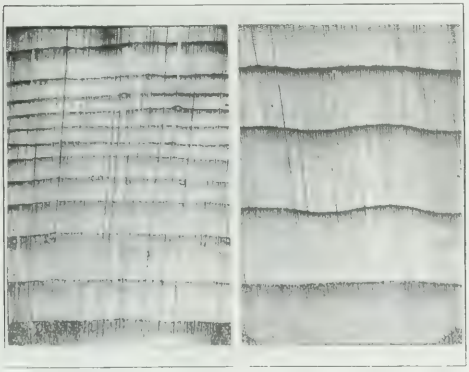


Fig. 21.
(a) Spruce Wood, transverse section × 10. (b) Balsam Fir Wood, transverse section × 10.

the reagent it is desirable to remove as much water from the fibres as is possible and in estimating it is best to examine several mounts.

It is sometimes desirable to be able to distinguish positively the wood of Balsam Fir from that of spruce. A simple method is as follows: Wet the piece of wood and cut a reasonably thin transverse section with a sharp pocket knife. Hold this up to the light and examine with a magnifying glass, giving 4 or 5 diameters enlargement. If the wood is Spruce resin canals will show as little darker spots. In Figure 21 a you see little open spaces surrounded by darker rims—it is the latter rims that give the shaded appearance in the diffused light an ordinary knife as described above. Now in Balsam (Figure 21) (b) there is no such appearance as this, so the wood may be positively distinguished. After a little practice one will have little difficulty in telling the difference between these two woods, especially if the color, weight and grain are also taken into consideration.

The separate fibres of different coniferous trees may often be distinguished by means of the marks made by the openings through which the sap passes from the fibre into the ray in the living wood. Figure 22, which

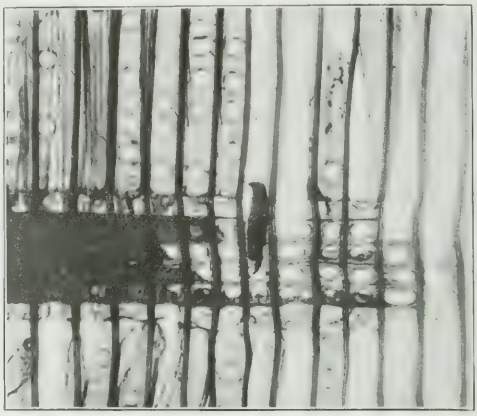


Fig. 22.—White Pine Radial Section × 150.

is a radial section of White Pine wood, shows very clearly the large holes or pits that form the passage between the ray and the fibre. The much smaller pits which occur in the cells forming the upper and lower margins of the ray, and which resemble very much at a reduced size the bordered pits showing on the fibres, are characteristic of certain woods. Being absent in Balsam Fir, they make it very easy to distinguish

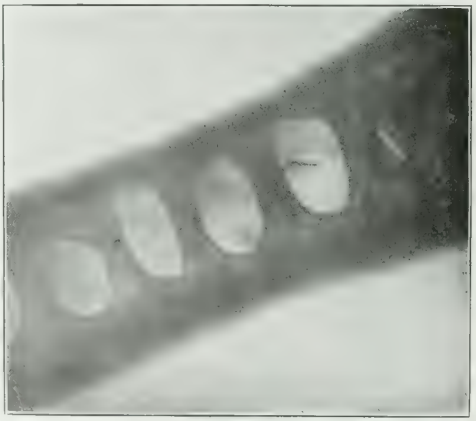


Fig. 23.—White Pine Fibre × 700.

this wood from Hemlock microscopically and since both of these woods lack resin canals they are readily separated from the other coniferous woods used in paper making. A single fibre of the White Pine magnified 700 diameters (Figure 23) shows the single large holes in the fibre where it crosses the ray while at one end a small slit surrounded by a darker border represents the marginal pit. The appearance of the marks

on the fibre of the Eastern Jack Pine where the ray cells are crossed is seen in Figure 24, in which the pits are much smaller than in the previous figure, and are distinctly grouped. Near the centre of the figure one can barely make out a bordered pit which is connected with the marginal ray cell. In Figure 25 of Spruce the pits, while approaching in size those of the Jack Pine, are not grouped, but are irregularly scattered. Between these scattered marks and the large single bordered pit near the end of the figure may again be seen a very small bordered pit. As has been mentioned above such a little pit would not appear in a similar view of Balsam Fir fibre, although the other marks would be much the same. It is only possible to make out these characteristics by careful examination with high magnification so the method could not be recommended for general mill practice, but is mentioned to show that it is possible to distinguish between many coniferous fibres as such.

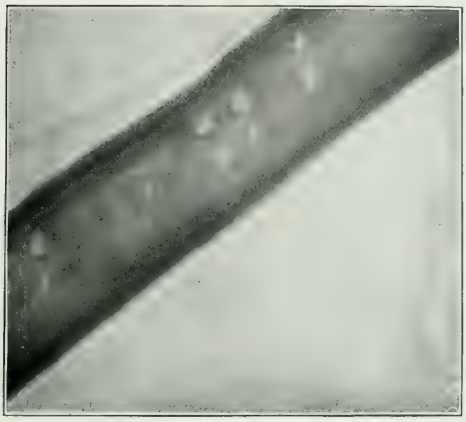


Fig. 24.—Eastern Jack Pine Fibre × 700.

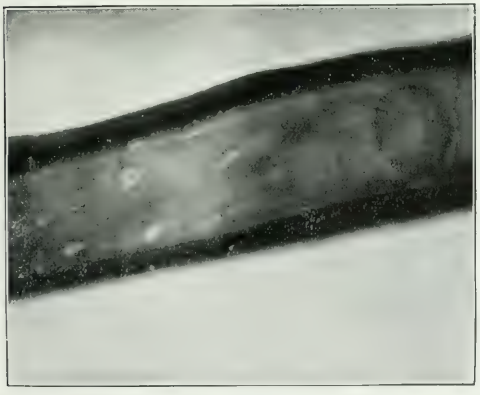


Fig. 25.—Spruce Fibre · 700.

Figures 26 and 27 are respectively of Spruce and Poplar fibres enlarged 150 diameters. The illustrations clearly show the ease with which the fibre from coniferous and broad-leaved trees may be identified. In the Spruce may be seen the ends of both very blunt and sharp-pointed fibres bearing the characteristic bordered pits, while in the Poplar two complete sharp-pointed, thicker-walled fibres lacking bordered pits may be seen lying across one of the short cylindrical vessels. As is stated above, vessels always occur in the wood of the bread-leaved trees and it is by means of the difference in the appearance of the vessels that the fibre from the various trees may be most easily determined. Vessels never occur in coniferous wood. The foregoing examples are only a few of the means of identifying the fibres of different woods, but serve to illustrate the general methods used in microscopic examination of the structure.

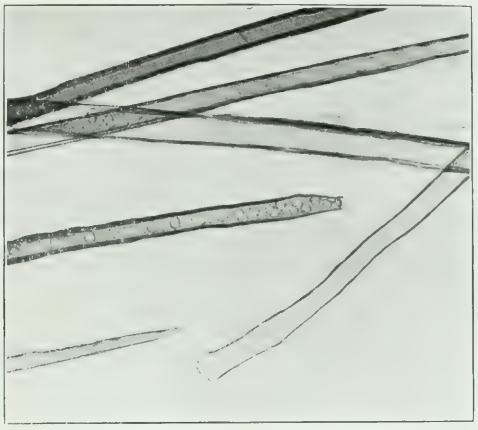


Fig. 26.—Spruce Fibre × 150.

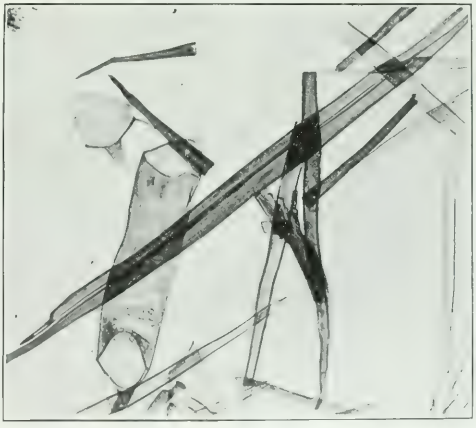


Fig. 27.—Poplar Fibre · 150.

The reproductions are from photomicrographs made by Mr. J. G. MacKinnon, photographer of the Forest Products Laboratories of Canada, to whom, as well as to Dr. Bates, Mr. Bryant and other members of the staff, I am much indebted for assistance and advice.

THE CHEMISTRY OF PAPER MAKING FIBRES

By JOHN S. BATES, Chem. E. Ph.D.

Superintendent, Forest Products Laboratories of Canada.

Paper Read Before the Technical Section of the Canadian Pulp and Paper Association, Montreal, June 19, 1915.

Paper has long since passed from the realm of luxury to that of necessity. The importance of the paper industry now places it among the foremost industries of the world. Papers are of many varieties, and are made from many materials by mechanical and chemical means. Of the important raw materials now in use may be mentioned spruce, balsam fir, hemlock, jack pine, long-leaf pine, poplar and other woods, which together constitute the most important source of supply, and the non-woody fibres, cotton and linen rags, straw, jute, hemp, and esparto. It should also be remembered that paper can be made from many other fibrous materials, in fact from almost any fibrous material, such as sugar cane, corn stalks, flax, sisal, cotton seed hulls, and a host of reeds and grasses. The trouble is that although pulp and paper can be made from these materials, it is not always possible to make money at the same time.

It may be laid down as a general principle that if a fibrous raw material can be used for any other worthy purpose it should not be used for paper making. For instance, cotton and linen are used for cloth, and only the clippings from shirt factories, etc., together with old rags are used in the paper mill. Good, sound wood of merchantable size is claimed first for lumber and only the small sticks and inferior species are (or should be) used for pulp making. And we must look for still further progress whereby practically all inferior species and much of our wood waste, both in the forest and at the saw-mill can be transformed into valuable pulp for the production of many varieties of pulp and paper compositions. The necessity of this economy will be appreciated when we remember that the price of finished newspaper is only about 2c per pound. This is roughly equivalent to lumber at $40.00 per thousand feet, showing how cheap the finished paper of newspaper grade really is.

Wood is the most logical of all fibrous material for paper making purposes. Wood possesses the necessary short fibre which can be readily isolated with high yields. Wood is abundant, compact, easily handled and cheap. Furthermore Canada is a logical country for the development of the wood pulp industry. There are the necessary supplies of suitable wood species and few countries are endowed with such wonderful river systems and water powers.

In the conifers the individual fibres or tracheids can be isolated with comparative ease by chemical treatment. Most of these woods are soft, easily penetrated by cooking liquor and not strongly lignified. There are no vessels and comparatively small development of medullary rays. The resultant pulp is uniform, and the fibre is long (about 3 mm. for spruce), giving great strength when felted into a sheet of paper. The crude pulp is, moreover, easily bleached, especially in the case of spruce. According to the figures for 1914 spruce constitutes 68.3 per cent of the total pulp wood consumption in Canada and balsam fir, which is very closely related to spruce from the pulp making point of view, contributes about 25.7 per cent. Hemlock amounts to 3.7 per cent, and jack pine 2 per cent, while poplar makes up the remaining 0.3 per cent. It will be seen that the conifers with a total of 99.7 per cent have a very good monopoly of the paper business.

Of the dicotyledons, poplar is of some importance and is usually accompanied by a certain amount of basswood. These "soft hardwoods" are porous enough to allow the penetration of liquors and the final pulp is easily bleached. In this case the pulp is a mixture of the separated fibres, vessels and raws, the vessels being present in very appreciable quantity and the medullary rays in a comparatively small proportion. The pulp fibres are very much shorter than in the case of the conifers, poplar fibre being only one-fourth or one-fifth the length of spruce fibre. These differences in length and fineness make poplar fibre of particular use as a filler in magazine paper and lithograph papers, etc., but prevent its use in the ordinary papers which are in such great demand, inasmuch as the cheap ground wood pulp from the conifers is quite satisfactory.

Although paper can be made from beech, maple and other hardwoods, the density of the wood and the thickness of the lignified cell walls hamper the penetration of liquor and the dissolving out of the non-cellulose materials. This makes the pulp very difficult to cook and to bleach. Furthermore, the fibre is very short and would have a very limited field of usefulness.

The chemical composition of wood is very important in relation to pulp making. Spruce, which may be taken as a typical example of pulpwood, contains from 55 to 60 per cent of cellulose and from 30 to 35 per cent of lignin on the dry basis. There are also 5 or 10 per cent of lower carbohydrates and small quantities of glucosides, resins, oils, tannins, proteins, and mineral salts.

The cellulose $(C_6H_{10}O_5)n$ is the stable constituent of the wood which withstands the disintegrating action of the cooking liquors and maintains to a large degree the shape and strength of the individual wood fibres. This we see in the final bleached sulphite pulp. For the benefit of those who are chemically inclined, it will be interesting to recall Green's formula, which has been suggested as representing the structure of the units which are combined in great number and in a vaguely understood relationship to form the ultimate cellulose molecule.

$CH(OH)-CH-CH(OH)$

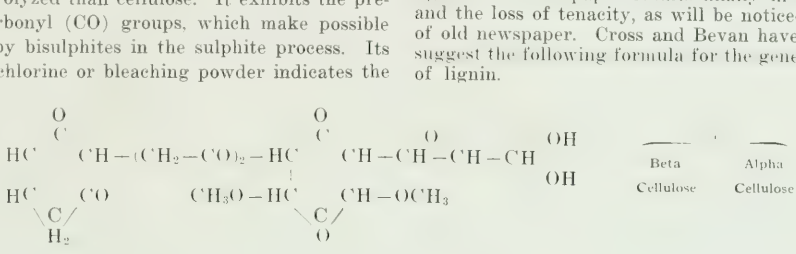
O

$CH(OH)-CH-CH_2$

O

It will be seen that this structural formula brings out the inherent chemical stability of cellulose to ordinary oxidizing and hydrolyzing agents, as well as its inertness toward reagents such as the bisulphites.

The lignin is an indefinite carbohydrate of higher carbon content approaching the empirical formula $C_6H_6O_3$. Lignin has fewer OH groups, and is more readily hydrolyzed than cellulose. It exhibits the presence of carbonyl (CO) groups, which make possible the attack by bisulphites in the sulphite process. Its solution of chlorine or bleaching powder indicates the presence of unsaturated ethylene groups and a quinone structure. The formation of methyl iodide (CH_3I) on treatment with hydriodic acid (HI) shows the presence of methoxy (OCH_3) groups. The low oxygen content also makes it very susceptible to attack by oxidizing agents, in fact even atmospheric oxygen. In short, lignin may be described as an unsaturated, cyclic compound sensitive to attack by chemical reagents. The lignin if left in paper results finally in discoloration and the loss of tenacity, as will be noticed in the case of old newspaper. Cross and Bevan have ventured to suggest the following formula for the general structure of lignin.



The colloidal mixture or compound of cellulose and lignin in the wood constitutes the so-called ligno-cellulose with which we are dealing. From a practical point of view the wood fibres may be considered as composed of cellulose units cemented together by the lignin components. It may be pointed out that the cell wall is more lignified toward the inside.

The ground wood process accounted for 52.7 per cent of the pulp wood consumption in Canada in 1914. However, this is purely a mechanical method of obtaining pulp, and we shall not stop to discuss it here.

The sulphite process uses 35.5 per cent of our pulp wood. The chemical basis of this process is the dissolving of the lignin by formation of an addition product of lignin and calcium bisulphite, this being typical of the action of bisulphites on organic compounds which contain carbonyl (CO) groups. At the same time there is hydrolysis of some of the carbohydrates of the wood and the whole operation is carried on under reducing conditions furnished by the SO_2. The chemical nature of the sulphite process is such that it is limited for the most part to clean coniferous woods low in resin.

The sulphate process has reached considerable prominence in Canada, and now accounts for 11.5 per cent of our pulp wood consumption. The caustic soda (NaOH) causes hydrolysis of the non-cellulose constituents of the wood, and in addition there is an attack of certain constituents by the sodium sulphide (Na_2S) in a reducing atmosphere furnished by the sulphide. This process is applicable to both resinous and non-resinous woods which are not properly reduced by the straight soda process. It can be employed on more varieties of wood and on poorer grades of chips than in the case of sulphite process.

The soda process claims only 0.3 per cent of the pulp wood condemned in Canada. The chemical basis of this process is the hydrolysis of the lignin with formation of lower organic acids which are for the most part insoluble as such, but which are dissolved by combination with the alkali. The application of the soda process to wood fibres is limited almost entirely to poplar and basswood in this country.

Passing to non-woody fibres, we may consider cotton as the purest natural cellulose fibre. Since both raw cotton and the cotton fibre as it exists in raw stock from the textile mills consists almost entirely of strong stable cellulose fibre, a mild chemical treatment with lime or caustic soda is sufficient to remove the small quantities of lower carbohydrates, resins, starch, etc., which may be present in the raw material. Jute has been called the typical ligno-cellulose fibre. The chemical composition is roughly 80 per cent cellulose and 20 per cent lignin, so that jute stands between cotton and wood from the chemical point of view. Straw, sugar cane, and a large number of reeds which have been used for paper making are inherently of a lower order, the cellulose content in most cases being even smaller than in wood. The fact that the stable cellulose is present only to the extent of 35 or 45 per cent on the dry basis will indicate at once the difficulty of employing some of these raw materials on an economic basis. The non-cellulose constituents of these raw fibres show in general a wider variation than in the case of wood and jute. In addition to lignin we have present a variety of indefinite carbohydrates, such as pectins, starches, etc. Although there is usually little difficulty in cooking away these substances and isolating the cellulose fibres, each raw material has characteristics of its own and must be treated accordingly. The wide applicability of the soda process is very fortunate in this connection.

The chemistry of paper making fibres does not always end with the cooking process. The pulp obtained from the digester is not pure cellulose, but contains from 1 or 2 per cent to 15 per cent or more of lignin or related compounds, depending on the raw material and the cooking conditions. The process of bleaching is based on the oxidation and solution of these non-cellulose constituents of the crude pulp by chlorine in the form of bleaching powder solution.

Beating appeals to the ordinary observer as a purely mechanical process and the important nature of this treatment is sometimes overlooked. In addition to the mechanical separation of the pulp into individual fibres and the reduction of these fibres by cutting and brushing out, there is an actual hydrolysis of the cellulose by the action of the water on the constitution of the cellulose molecules. This is unimportant in a superficial beating of newspaper stock, but is vital in the preparation of pulp for writing papers. An extreme condition, of course, is reached in grease proof papers, where the fibre is gelatinized to a large degree.

The effect of high temperatures on the paper machine dryers is also well known to the paper maker. There is danger of injuring the sheet by formation of a certain amount of oxycellulose.

In fact, we have only touched on the outstanding chemical characteristics of paper making fibres. The progress of science will be a welcome aid to the papermaker in his search for the ideal paper.

WOOD ROOM PROCEDURE AND ITS TREATMENT OF PULPWOOD IN CONNECTION WITH NEWSPRINT MANUFACTURE

By H. S. TAYLOR

ENGINEER, SPANISH RIVER PULP & PAPER MILLS.

From a lumbering operation in the northern forests, to the corner news stall in a crowded city there appears to be as wide a separation as could possibly be found betwixt any two lines of endeavors, where the one has apparently absolutely no bearing on the other, but in reality the relation is so close that were the lumbering operation to cease, the news stall would immediately be deprived of its means of existence. Further this relation is so direct that it can be likened to a chain, each link of which represents a part of news print manufacture, for the chain that binds these so apparently widely-separated subjects is a chain constructed at the forest end of wood and at the news stall of paper, such a transformation being made possible by the modern news print mill in which the chain enters as wood, the natural product of our forests, and departs as paper upon which is to be recorded the news and gossip of the world, to be scattered broadcast to all who read under the trade name of news print paper.

It is not directly with paper that this article has to do but with a certain part or process of its manufacture, viz., the preparation of the wood from its so called rough state as cut, to a condition where all bark and other surface accumulation has been removed and the material fitted to proceed; a simple mechanical requirement one would say, and simple the process undoubtedly is, but nevertheless vital to all paper makers in proportion to the quantity of their product and the cost of the wood itself.

As wood by weight is 95 per cent of news print paper we can practically say that paper is wood, its structure being changed in formation only; and we may state that approximately one and one-third cords of rough wood are consumed in the manufacture of one ton of paper, a 200 ton mill consuming 267 cords of wood per day, the value depending upon the location of the mill, cost of cutting, etc. Of this 167 cords a certain proportion is bark composed of the outer and inner layers, and is valueless from a paper making standpoint, in that the outer bark has no fibre, and the inner layer while possessing a firm fibre must be rejected on account of its color, therefore the bark must be separated and removed and it is the aim of the news print manufacturer to secure equipment that will mechanically remove this bark, and not remove or fracture the wood itself, 10 per cent efficiency being attained when such a condition can take place.

Paper Delivered before the Technical Section of the Canadian Pulp and Paper Association, Montreal, June 19th, 1915.

Pulpwood upon arriving at the mill is slashed to lengths as required by the mill's equipment, and then delivered to the so-called wood room, wherein is housed the equipment for removing the bark or rossing as it is called. The design of the wood room and equipment contained therein differs greatly at different mills owing to size of wood, location, and general conditions, but all meet at a common point in the performance and results of the process, the wood being mechanically delivered to a storage section within the building and from this storage delivered to the machines, and prepared by being forced laterally against revolving disks with knives set therein that shear off the bark together with a certain amount of wood, delivering this product as waste and the prepared block to the ensuing process.

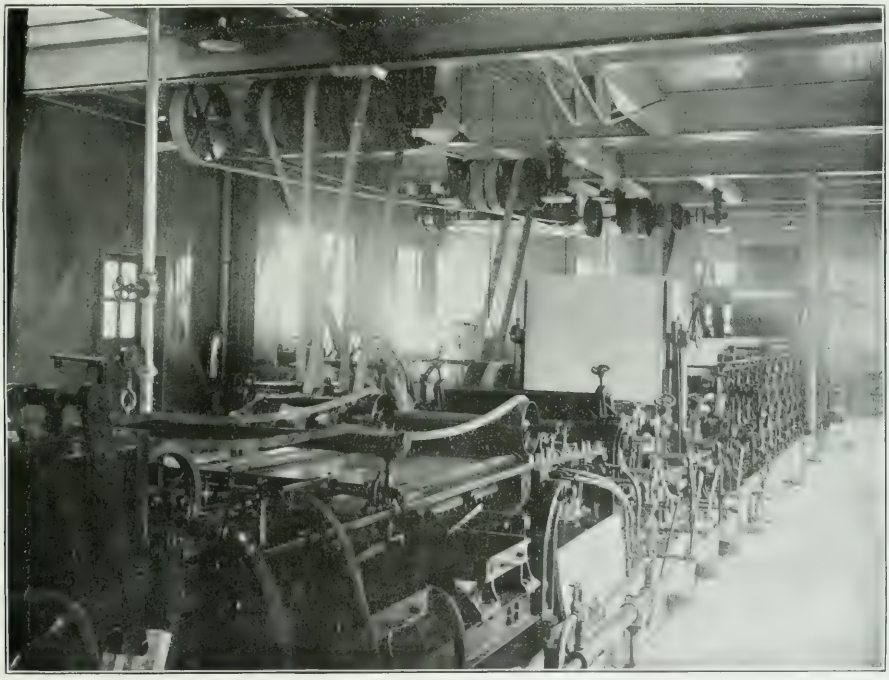
Of the two systems of handling the blocks within the wood room much can be said. The wet system, so called, consists of a tank or reservoir in which the blocks are floated for delivery to the machines. Its opposite, the dry system, involves positive conveyors of either the chain or cable type which conveys the wood to the point where the barker operator can deflect its course to the machine. The former system offers the advantages of greater storage and no mechanical parts, thus insuring the room in as far as the delivery is concerned against delays from breakdowns, but in the experience of the writer for mills handling 300 cords or more per day the wet system is inferior in actual operation to the dry system, as even with the best of circulation the movement of the wood must be directed by extra labor, not reuired with positive conveyors correctly designed. The block tank, while insured against a mechanical shutdown, is not so insured against a physical one, and must be emptied so often in order that the bark and sinkers be removed, a costly operation when happening daily as is often the case when river wood is being used exclusively. This material together with the waste is saturated with water and thereby loses a great part of its only value, namely fuel; also there is the water to contend with from which the blocks must be lifted by hand or propelled to conveyors that remove them, this action being slower than if positive conveyors were forcing the wood upon the operator. During the winter months the water must be heated and if sulphite is a part of the mill's product, the water absorbed by the wood itself is a detriment to the sulphite process, dry wood giving much better results; therefore I firmly believe that unless conditions absolutely prohibit, the dry system should be selected, and will cost the owner less money in maintenance and attending labor.

We now come to the rossing machines or barkers themselves, and as before stated the underlying principle of this equipment is similar throughout, viz., a rotating disk with knives set therein, against which the wood is forced with the resulting removal of bark as required, and of wood that is a direct loss. The most simple of this equipment from a mechanical stand is the common disk barker, the operator of which selects a block from storage, places it against the knives, and by rotating causes the bark to be removed with a minimum loss of white wood. To increase the speed of operation on this hand barker and hence its capacity, attachments were invented for rotating the block mechanically, the operator guiding the action of the block by means of the attachment, although he must fetch and remove the block by hand. The next so-called improvement provided the mechanical barker. This is nothing more or less than the hand machine with a complete set of attachments driven by air or steam. The operator is seated before the machine, and by means of hand and foot levers controls the action of the block. From the time it enters the conveyor leading to the disk to its subsequent departure as prepared wood, the operator is not in actual contact with the block at any time in the process. This latter type will undoubtedly do good work on wood of large diameter, 12 inches or greater, and if any quantity of such sized wood is to be handled, such equipment will be a good investment, but for averaged sized wood, nine inches in diameter and under, such in my experience is not the case, as the action is not automatic as expected, either hand assistance being reuired or the block is pared to such an extent that the loss is prohibitive; the numerous conveyors and other mechanical attachments make maintenance costs high, and practically two men are required to operate the machine.

The types of machines as mentioned above are not satisfactory for longer than two foot wood, and are not designed for longer lengths, and of the three types mentioned the hand barker with simple attachments is in my opinion the most satisfactory on average-sized wood, from the standpoint of economy in wood, waste, labor and maintenance.

Eight cords per ten-hour day can be prepared by one operator with wood supply equal to his demands, and this wood is prepared with the minimum of waste and lost motion. With labor at 20 cents per hour, wood should be barked on this machine for not more than 30 cents to 35 cents per cord, and the blocks are carefully gone over with a minimum of delay. The all-mechanical barker can not show any such results and is not satisfactory except for wood of large diameter as before mentioned.

A fourth type of barking equipment now on the market is made up of the regulation disk, except that the face of this disk is curved and of smaller diameter; a toothed cylinder controlled by a hand wheel in the hands of the operator forces the wood against the disk, the teeth in this cylinder being set spirally, thus rotating the wood past the disk screw fashion, and allowing of operation on much longer blocks than any of the before mentioned types. Capacities up to twenty-five cords per ten hour day are supposed to be common with



Paper Machine, Forest Products Laboratories of Canada.

this machine, but I can not say that my experience justifies such a supposition. Under the best of conditions when working with the wet system and with average wood as regards size and regularity, twenty cords per day is a good run and the average will be nearer sixteen on many days. This machine requires two men to operate it, is very wasteful of white wood, and the spiral motion of the block when at the knives imparts a slivery condition to the surface of the wood that is detrimental to a fine quality of ground wood pulp. The speed of the machine is excessive, running up to 1400 r. p. m., causing high maintenance and repair costs. On average sized wood the hand barker with simple attachments, although a greater number of these machines will be required for the same capacity will be found the cheapest per cord rossed, when taking labor, waste and maintenance into consideration. However, for four-foot wood, for which there is a steadily increasing demand, the spiral feed machine referred to above is available and will handle this length of block in a more satisfactory way than any of the other types.

The result of numerous tests that have been made to determine percentage of loss in rossing show that bark comprises 10 per cent of the volume of the stick, and that the total percentage of waste under average conditions is 20 per cent and may easily run to 25 per cent. The loss in wood is therefore 10 per cent to 15 per cent, and referring to the 200 ton mill before mentioned consuming 267 cords per day, the wood being valued at, say $8.00, we find that a 10 per cent to 15 per cent loss would amount to 8,000 to 12,000 cords per year, the value of which would be $64,000 to $96,000. Such figures appear excessive but there can be no doubt of their truth. They explain the reason why the manufacturer is entirely unsatisfied with the present equipment at his disposal. It is an assured fact that the more mechanical the barker, the greater the waste. On this one fact alone is based a great part of my contention, that the simple machine is to be preferred, although the number of machines required will be greater. A simple rule is to allow six cords per ten hours per attachment, and plan to install a sufficient number to handle the required output, taking into consideration whether it is planned to operate the room continuously or on but one shift, such a rule allowing of enough spare equipment to safely cover the requirements. The consulting engineer under whose estimate a wood room is installed perhaps prefers the higher capacity machines as initial costs are lower and initial costs mean much to him. This may account for the number of mechanical barkers that are installed, and later find themselves consigned to the scrap heap.

Owing to the great loss in waste in connection with knife barking operation there has been carried on by a number of the leading news mills, experiments to determine if some other means than knives cannot be devised to remove the bark, and only the bark, leaving the wood untouched, and the present so-called tumbling barker installations are the direct result. These tumbling barkers are to be seen at a number of the leading news mills in Canada and the United States, and are at present manufactured in two forms, the continuous barrel after the principle of the cement kiln, receiving a continuous flow of wood at one end, and discharging it at the other, and the intermittent type after the principle of the bleach boiler, into which a charge of blocks are dumped, and rotated until barked, being then discharged as prepared wood. The inner surface of both types is provided with angles and other blunt edges that break and loosen the bark, the contact of the blocks themselves doing the final work of removal. The continuous tumbler while satisfactory in some ways is not yet enough perfected for preparing wood for the best quality of news print. It does not remove all the bark evenly, necessitating more or less cleaning up with hand machines, and the wood and bark separation in the tumbler itself is crude, in that the fine particles of bark although loose adhere to the wood, and a great number of these particles eventually find their way to the sheet. The capacity of these tumblers is great, being nine to ten cords per hour per tumbler, and the cost of labor about 6 cents per cord. Also the original investment is not large, as the equipment can be operated in the open, the only reuirements being supply and discharge conveyors outside of the actual installation of the machines themselves, however, I have yet to see the continuous tumbler installation that is entirely satisfactory for preparing wood for a good quality of news print paper.

The intermittent tumbler, two sizes of which are on the market, the larger said to be satisfactory for four foot wood, appear to solve the problem much more satisfactorily, as the operation of these machines leaves the wood clean and bright, all the bark having been removed by a continuous flow of water in one journal as a supply, and out the other as discharge. The machines will handle from fifty to sixty cords per twenty-four hour day, or two to two and one-half cords per hour per tumbler, and are the most satisfactory equipment of this class that I have seen in operation. None of the objectionable features of the continuous tumblers as regards dirt and bark are present, and the attendant labor per cord is practically the same, costing about 6 cents. The initial cost of an installation of these machines, however, is high costing $8,000 to $9,000 per tumbler, as a building with large capacity block bins, barker floor, discharge floor and bark floor is required, and when constructed of fire proof materials, with the attending improved conveyors, etc., the initial cost per cord of capacity will undoubtedly be four to five times greater than that for the continuous type. However, I believe the greater investment is justified if it be proposed to install tumbling barkers, and such an installation will surely lower the operating costs of any large news mill, as at the very least 10 per cent saving will be effected in the cost of the wood alone, and the labor costs will be cut to 50 per cent of that required in a knife barking room for equal quantities of wood where the demand for quality is insistent. Even for a poorer quality of news print the labor saving will not be less than 25 per cent. Figure this out for your own mill and the result will be of interest to you.

The one feature of the tumbling barker operation that must not be forgotten is that strictly speaking, only wood that has been in the water two or three months should be treated on these machines, and obviously the longer the wood has been in the water the more easily can the bark be removed. Rail wood, or wood that is railed direct from the cutting to the mill is not satisfactory for this method of treatment, in that the time required to bark it, and the attendant cleaning up eliminates the saving in comparison with ordinary knife barker operation.

The removal of bark from pulp wood by hand peeling has been tried out by a number of manufacturers, but in as far as I can learn this method has proved too costly and therefore unsuccessful. The operation

has been carried on at the scene of the cutting, the logs being driven or railed in a peeled condition accumulating a coat of brown skin and other objectionable features, and as only a small percentage of the total cut is so treated I will not dwell longer on this subject.

It may be that statements or costs put forth in this article will be disputed, and I hasten to say that the arguments and figures herein shown or expressed are the results of my own experience, and as this article is offered perhaps more for discussion than otherwise, results or data conflicting with what has been stated herein, that are susceptible to proof are welcome.

Hydrated Cellulose or Lignocellulose Material

Judson A. de Cew, of Montreal, Quebec, Canada, Patentee; No. 1,140,799; Patented in May 25, 1915.

This invention relates to a process of hydrating cellulose or lignocellulose material, the particular application of the invention being the treatment of pulp material used in the manufacture of paper.

Every cellulose material contains a certain amount of water of hydration unless it has been artificially removed. These materials also have a tendency to absorb a certain quantity of this water of hydration in proportion as the OH group is more or less suppressed by combinations with the negative radicals in the molecule. Cellulose materials have a weakly acid character, and more weakly basic character, therefore they will absorb or combine with a very small amount of alkali. For instance, the amount of sulphuric acid that will react with a cellulose material is about 5 per cent., while the amount of caustic soda that will combine with it is about 2 per cent.

I find that the hygroscopic character of any cellulose material is greater when it is combined with alkali, than when it is combined with acid, and that when it is in the basic condition, it has a constant tendency toward greater hydration. I also find that this tendency toward hydration can be still further increased by the addition of other materials in very small quantity, such as carbon bisulphide.

Carbon bisulphide is soluble in water to about 2 per cent., and combines with the alkali Na_2S, forming the soluble compound Na_2CS_3 (sodium thiocarbonate), and in this way it may in either form be brought into reaction with the cellulose.

The main object of this invention is to provide a process of treating a cellulose or lignocellulose material with a dilute alkali, an alkaline thiocarbonate or an alkali and carbon bisulphide or one of its compounds, whereby the material will absorb water and become hydrated, so that it can be ground by mechanical processes into strongly fibrous material.

In carrying out my invention, it must be understood that only a small percentage of alkali is actually absorbed by the cellulose, and the resultant product is quite distinct from the alkali-cellulose formed by the combination of strong caustic soda with cellulose in viscose and mercerizing processes. In forming alkali-cellulose, it is necessary to use about fifty parts of caustic soda to one hundred parts of cellulose, and this treated with about fifty parts carbon bisulphide becomes soluble, forming viscose. The object of the viscose process is the destruction of the fibre structure, whereas in my process the object is to maintain in full the structure of the fibre, the only change being due to hydration.

In the mercerizing process, there is also an alteration in the structural character of the fibre, but this takes place only when cellulose is treated with caustic soda of a strength exceeding 13 per cent. of NaOH.

In my process, plastic or soluble cellulose is not formed nor is this the object desired. What is aimed at in my process is the weakest possible alkaline condition of the fibre, which means that a certain small percentage of alkali has been taken up by the acid radicals in the cellulose molecule. The advantages of the slightly basic condition of cellulose material for special purposes are not generally known, and the disadvantage of the acid condition is not known. For example, in the manufacture of sulphite cellulose, the product is made by an acid process and will naturally contain a small percentage of acid which cannot be removed by washing, this acid being either sulphurous or sulphuric acid. If sulphurous, it will be finally oxidized to sulphuric acid, and the constant tendency (which is increased by heat or drying) is to form hydrocellulose and make the product brittle or tender.

This is a great disadvantage in the making of strong fibre paper from sulphite pulp, for owing to the acid character of this fibre it does not become hydrated in the beating engine with the same facility as if it were alkaline, and the acid in its composition is constantly destroying the strength, especially when it is heated or dried during or after manufacture. On this account sulphite papers are generally weaker than those made from fibre isolated by an alkaline process.

My process not only prevents the tendering action going on in a cellulose material which is acid, but places it in a chemical condition for the rapid absorption of water, and this hydration has much to do with the strength that can be obtained from the fibre when it is made into paper. Papers made from fibre isolated by the sulphite process will be, when using my process of treatment, as strong as any paper made from fibre prepared by any other method. This, however, is but a special application of the process, for any fibrous material, which in its naturel condition offers resistance to the absorption of water, can be made more hygroscopic by treating it with a very small amount of alkali or alkali and carbon bisulphide.

Any woody material in the form of chips, blocks, sawdust, etc., if treated by a purely mechanical process of crushing or grinding will be reduced to a more or less pulverulent non-fibrous pulp, because without hydration the cells are so strongly cemented together that they will break before they will pull apart into separate fibres. If, however, this woody or fibrous material be first brought into a condition of hydration by treatment with a very dilute alkali (and) combined with CS_2, the cells of fibres will be more easily separated from each other, forming a longer, stronger and better pulp. In any process heretofore known, which uses alkali in the treatment of woody material in this way, it is always understood that sufficient alkali is employed to effect a chemical resolution of the ligno cellulose, either partial or complete, in which case there are more mechanical changes than that of merely producing the condition for hydration. In my process, I use solutions so weak that the fibre substance will absorb approximately 2 per cent. of its weight of alkali, in which case it cannot be again washed from the fibre.

A special application of this process would be the

(Continued on Page 378)

PULP AND PAPER NEWS

The many friends of Welland D. Woodruff, President of the Lincoln Paper Mills Co., Merritton, Ont., are congratulating him on his marriage to Miss A. Wallace, of St. Catharines, which took place on June 23. The event was a very quiet one, and Mr. and Mrs. Woodruff will reside in St. Catharines.

Malcolmn McSporran, accountant of the Victoria Paper and Twine Co., Limited, Toronto, was united in marriage recently to Miss M. Butchart, daughter of a well known Toronto builder. He was presented by the staff with a congratulatory address accompanied by a handsome cabinet of cutlery and a purse of gold.

An interesting judgment has been handed down in the High Court of Ontario granting the Inland Pulp and Paper Co. and H. B. and C. M. Eshelman, who are President and Secretary, respectively, of the company, the sum of $18,300 for lands taken for the new Welland Canal. This amount is $453,700 less than that asked for by the two concerns. The Inland Pulp and Paper Co. and Eshelman Bros. joined hands in connection with their claim against the government, and asked for $472,000. The canal valuator offered $18,300, and Mr. Justice Cassels has just upheld the offer.

According to the latest return there are now in Canada 150 daily papers, 7 tri-weeklies, 45 semi-weeklies, 1,065 weeklies, 40 bi-weeklies or semi-monthlies, 250 monthlies, 3 bi-monthlies and 188 quarterlies or a total of 1,475 publications.

At the annual meeting of the Globe Printing Co., Toronto, held last week, Rev. Robert A. Jaffray of Wuchow, China, son of the late Hon. Robert Jaffray, President of the Globe for twenty-six years, was made a Director. The other directors were all re-elected. The greatest increase in circulation in the seventy-two years history of the paper was reported for the past twelve months.

A deputation of sixteen prominent Chinese sent by the Chinese government in an industrial tour of the United States, visited the industry of the Beaver Board Co. at Thorold, Ont., last week and were shown through the plant with which they were much interested. Thorold is the only Canadian town which the delegates have visited since their arrival in the United States.

E. H. Harcourt, president of the E. H. Harcourt Co., Limited, Toronto, lithographers, passed away on June 12. For twenty-five years he was connected with the Copp, Clark Co., Limited, publishers and manufacturing stationers, and some ten years ago branched out for himself. He was a leading business man and highly esteemed.

A federal charter has been granted to Newsome and Gilbert, Limited, with a capital stock of $100,000 and headquarters in Toronto to take over the plant, goodwill and assets of Newsome and Gilbert, law and commercial stationers. Among those interested in the new concern are Wallis Burn and George W. Woodland, who have been connected with the old company for a number of years.

Many friends in the pulp and paper trade will learn with regret of the death of William Scott, superintendent of the old Welland canal. While on an ispection trip he was found lying unconscious beside the canal bank having sustained injuries by falling from his buggy which proved fatal. The water had been shut out of the canal for some days and was let in last week when all the pulp and paper mills, who derive power from the waterway, were again put in operation. Mr. Scott was well liked by all the men in the trade.

A provincial charter has been granted to the Monteith Pulp and Timber Co., Limited, with a share capital of forty thousand dollars and headquarters in Toronto. The company is empowered to manufacture and deal in timber, logs, pulp wood, etc. and among those interested are E. R. R. Heyland, Toronto and James Thompson, M.P.P. of Havelock.

More plants making bonds and writings have sent out notices to their customers withdrawing all prices on colored papers owing to the growing scarcity of supply and the uncertainty of deliveries as well as the high costs of all colors.

The Canada Paper Co. have declared a half yearly dividend of three and half per cent. on the preferred stock of the company. The Riordon Pulp and Paper Co., Montreal, have also declared their regular quarterly dividend of one and three quarter per cent. on the preferred stock of the company.

Owing to the recent changes in the Dominion Dairy Act requiring butter to be wrapped, several Toronto firms are making a specialty of supplying various creameries and general stores with genuine vegetable parchment paper. Owing to the war, prices on parchment paper have advanced fully thirty three and a third per cent. A big business is being developed in this branch of the paper specialties departments of certain firms.

There has been sent to many Canadian customers a neat scroll headed the "Roll of Honor", giving the names of the employees of R. Hough and the Limehouse Paper Board Mills, Limited, of London, Eng, who have answered Britain's call to arms. From this one firm no less than seventy-four persons have gone to the front. The scroll is beautifully decorated with the flags of the Allies in colors. The John Christie Co., of Toronto, are the Canadian representatives of R. Hough.

The Butterick Publishing Co., of Toronto, will shortly remove their factory from the Lowes building on Sherbourne street to their splendid new and imposing five storey structure on Wellington street west, which is one of the finest and best equipped on the continent.

John R. Barber the veteran paper manufacturer who on July 5 will celebrate his seventy-fourth birthday, is in fairly good health and was able to attend the annual meeting of the Canadian Manufacturers Association held in Toronto recently. He is the oldest member of that body being present at the inaugural gathering in Hamilton in August, 1874, which was the beginning of the National Policy movement in Canada and also of the present association of manufacturers.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine).

The Canadian Reciprocity Pact of July 26, 1911 was brought again into the limelight before General Appraiser Hay in New York a few days ago. This time it was in the case of Kupfer Brothers who imported a certain kind of wrapping paper, and claimed same free under the provisions of the Canadian Reciprocity Act. Appraiser Hay in his ruling said: "This is a protest against the assessment of duty on a certain wrapping paper under Paragraph 328 of the act of 1913. The protestant claims free entry under the so-called Canadian Reciprocity Act of July 26, 1911. The provisions of paragraph 328, so far as the same is applicable to the merchandise here under consideration, is: "Wrapping paper not specially provided for in this section, 25 per cent. ad valorem". In the light of the enacting clause of this act, that provision is in conflict and inconsistent with the act of July 26, 1911, the so-called Canadian Reciprocity Act. The act of July 26, 1911, therefore, so far as this merchandise is concerned, is repealed by the following language of paragraph S of section IV: "That except as hereinafter provided.... all acts and parts of acts inconsistent with the provisions of this act are hereby overruled". The protest is therefore overruled."

* * *

The new addition of the Kalamazoo Vegetable Parchment Company's mill is now practically completed. New machinery purchased by the company has been installed and several departments are now in operation. The additional space enables the company to greatly increase its facilities for deliveries. The rapid growth of this company during the past few years has been the talk of many paper people in the middle west.

* * *

"Safety First" is taking a strong hold on the employees of Eaton, Crane & Pike Company of Pittsfield, Mass. The company adopted the programme recently and a few days ago issued a second bulletin to its employees. This bulletin cautions every employee against crossing the railroad tracks at any place except at regular crossings.

* * *

A new addition to the mill of the Oxford Paper Company is reported at Rumford, Me. According to the information received by your correspondent, the finishing room of the mill is being extended to within twenty feet of the coating mill, and the beater room is also being greatly enlarged.

* * *

At a meeting of the Board of Directors of the Bagley & Sewall Paper Machine Manufacturing Company, held last week at Watertown, N. Y., the following new officers were chosen for the ensuing year: Stuart D. Lansing, president; Charles W. Valentine, vice-president; C. E. Kinne, secretary and C. D. Bingham, treasurer. These are all new officers, with the exception of the last named owing to the recent death of George A. Bagley.

* * *

The sales force together with the managers of the various mills of the United Paperboard Company, held a two day convention in New York city during the past fortnight. Many matters of importance were discussed and it was decided to manufacture several new lines of boards at the different mills. Papers were read and the results of experiments were shown by the millmen and supplemented by discussions to demonstrate the possibility of turning out successfully many other special grades.

* * *

The employees of the home office of the International Paper Company held their first annual outing during the past week at New Dorp, Staten Island, New York. Many guests attended, including representatives of the various subsidiaries of the present company. The affair proved a success in every way, and the committee on arrangements received much praise for the manner in which they handled the crowd.

* * *

Mill B. of the Gould Paper Company at Costerville, near Port Leyden, N. Y., was destroyed by fire during the past fortnight, entailing a loss of approximately $70,000. This mill was originally built in 1869 by the Herkimer Paper Company. It was rebuilt in 1882 and in 1898 it was purchased by the International Paper Company who operated it for nine years and sold it to the Gould Paper Company.

* * *

The repairs and additions to the old boiler house of the Fos River Paper Company, which were started several months ago, are now rapidly nearing completion. The concrete floor is practically completed and new installations are soon to be made. Quite a few other improvements are reported at the mill, and various departments are closed from time to time to allow for same.

* * *

The rossing plant of the St. Regis Paper Company at Carthage, N. Y., will shortly be placed in operation, according to a statement made this week by Superintendent Shafter. The log drive which has been held back on account of low water, is being pushed along by a slight raise in the flow of the river, due to the recent heavy rains, and is slowly reaching its destination.

* * *

The Kalamazoo, Mich. paper manufacturers were the hosts during the past fortnight of about three hundred paper distributors. From all parts of the United States they came to the paper centre to enjoy the hospitality of those from whom they daily had dealings with. It was the occasion of the first annual outing of the Kalamazoo Paper Manufacturers, and nothing was left undone in making everybody have a good time, and an instructive and educational visit to the paper city.

* * *

According to the Norwich Bulletin, Norwich, Conn., the Norwich Paper Mills Company has started operating its second machine. Advertisements appeared in that organ during the past fortnight calling for help to be used in the sorting department of that mill.

The Markets

CANADIAN MARKETS

The news print market appears to remain about the same and advertising, which picked up in a number of papers during May and April, has fallen off again owing to unseasonable weather. There is, however, a fair demand for news and prices are unaltered. There are a number of inquiries from across the line, but they are not so numerous as some time ago. Any increase in production is being taken care of in export business rather than locally. In the book, bond and writing line about the same state of affairs prevails, and the color situation is the most serious aspect. All mills have withdrawn prices on colored bond and writing papers. Some have raised the figure a quarter of a cent. It is expected that things will be rather quiet during the next two months. Tissue and toilet paper plants are fairly busy.

In the ground wood line there is no improvement in demand, and all shipments are made principally on contract. The sulphite situation stays much the same. Reports from abroad point to a growing firmness in the chemical wood pulp market, and buyers are becoming reconciled to advancing quotations while slightly increased requisitions have strengthened the market. Many mills are still continuing to hold out for bargains in stock.

In the wrapping paper line matters are rather quiet after two very good months, in which some jobbers report an increase as high as ten per cent over the corresponding period of last year. Orders from now on will be harder to secure but, after the usual midsummer depression is over, it is expected there will be a nice business for fall. Price cutting continues in some lines. It is understood that a better arrangement has been effected in regard to manila bags and a new price list has gone into effect, the discounts being decreased. The following prices have been sent out to the trade: Under ten thousand the discount will be fifty, ten and five; from ten thousand to twenty-five thousand, sixty off; twenty five to fifty thousand, sixty-and two and half off; fifty to one hundred thousand, sixty off; over one hundred thousand, sixty and ten; and in car load lots, sixty, ten and two and a half, which is some seven and a half per cent lower discount than heretofore. It has also been decided to limit production in some lines, for which there is not a great demand.

The waste paper market has dropped very low during the past few months and, at the present time, there is practically no demand for this commodity, and mills are buying entirely at their own prices. E. Pullan of Toronto, who is one of the largest dealers, has sent out notices to the trade that he has been forced to make adjustments in the prices that he is paying customers, and will make sorting tests of each lot of paper. A leading member of the trade, said this week: "Were it not for the fact that better grades have shown a little improvement recently dealers, who handle waste paper principally, would feel like closing up shop. Some little time ago it was felt that low grades, such as mixed paper and folded news, had touched bottom, but this was an error, and the market is now in such a condition that large stores or manufacturing concerns, which accumulate quantities of waste paper, may consider themselves lucky if they can find a dealer who will take their paper away without charging them for the trouble. There is probably more mixed paper and folded news being burned up than ever before. How long this condition will continue is something of a question. Dealers cannot see any sign of marked improvement."

In roofing stock, so far as importations are concerned, there has been a jump of about forty cents per hundred during the last ten days, and the buyer pays the war tax in addition. It appears that the materials are being used abroad in the manufacture of shoddy which accounts for the advance.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.95 at mill, in carload lots.
News (sheets), $2.00 to $2.15 at mill, in carload lots.
Book papers (ton lots), 4.25c to 5.75c.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.35 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.10 to $3.50.
Unglazed Kraft, $3.50 to $4.50.
Glazed Kraft, $4.50 to $5.50.

Pulp.

Ground wood pulp (at mill), $15.
Ground wood $19 to $22, delivered.
Sulphite (unbleached), $38 to $43 del. in Canada.
Sulphite (unbleached), $38 to $44, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.00.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 40c.
White blanks, $1.00.
No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.55.
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Folded News, 32½c.
Over issues, 45c.
No. 1 cleaned mixed paper, 22½c.
Old white cotton, $1.75.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.20.
Black linings, $1.25.

New light flannelettes, $3.75.
Ordinary satinets, 80c.
Flock, 90c.
Tailor rags, 65c.
Blue overall cuttings, 3.37½.
Manila rope, 2½.
No. 1 burlap bagging, $1.00.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground wood, $20 to $23, delivered in United States. States.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine.)

The grinders of ground wood pulp are beginning to find hope in the prospect of poorer water conditions throughout the country. Thus far there has been no signs of improvement in the sales of ground wood, for the water supply in most localities has been sufficient to enable the consumers to look out for their own needs. Consequently there has been comparatively little demand made upon the market for stock. Inquiry during the past week has been lacking in life. Those who are in quest of pulp go "shopping," so that it has been necessary to meet this state of affairs by concessions. Prices at present are weak, nor do they show any tendency to strengthen, despite the fact that it is conceded that business will surely improve within a month. Reports indicate that the rivers in the East are beginning to feel the effects of the hot weather, and that it will be compulsory for many of the mills to look about for further supplies of pulp soon. Just how much a shortage of water will help the sales of ground wood pulp, can hardly be forecasted. It is understood that many mills have had their machines running at full capacity with the idea of placing aside considerable reserve stock. But, general belief is that this will not materially retard a change in the market, when conditions warrant one.

The chemical pulp situation is becoming more complex, as time passes, and as a result, Scandinavian pulps are strengthening continually. In some instances, prices have advanced, and on the whole the inclination of the market is forward. It is evident from the way the mills are interested in conditions, that they are in a position where it would be advisable to assure themselves of plenty of pulp for the future. However, they do not appear to feel that the present big prices are justifiable, and, failing to bargain with the importers, are buying in "spot" lots, just enough to cover immediate needs. Judging from recent events, it is not likely that any large quantities of Scandinavian pulp will find their way to United States shores. In the first place there is not enough buying being done to make it feasible for importers to transport very much pulp to local docks. Those who are waiting for the foreign mills to lower their prices may find their patience put to the test. Advices from Scandinavia do not leave room for any suspicion that there is even the slightest sign of a weakening on the part of the pulp men. The stage has been reached where it is simply impossible to sell stock at prices lower than those now being quoted. Italy has placed an embargo on Sicilian sulphur, and England has shut off her coal to neutral nations. These facts make the future output of foreign pulp doubtful. Unbleached sulphite has shown slight improvement during the week. Bleached sulphite and sulphates are firmer, but inactive. Krafts are comparatively scarce, and are bringing higher prices.

Old waste papers are said to be in a worse condition than they have been in for over 25 years. There appears to be absolutely no demand for stock, and it is only by quoting extremely low prices that the mills can be induced to even consider buying. The market has fallen off to such an extent that the collections have decreased about in proportion.

It hardly pays the collectors to continue work in such times as the present, so many of them have resorted to other means of earning a livelihood. Common mixed papers are suffering, perhaps worse than any other grade. They are ordinarily in good demand by the board mills. But, as these have been operating on decidedly poor time, there has been absolutely no way of disposing of mixed papers. While the market is at about 12c, quotations at 10c are very frequent. No. 1 mixed papers are selling at 17½c to 20c. Hard white shavings continue as low as $2.15, while soft shavings have reached the low mark of 45c. Flat stocks range from 75c to $1.05. Over-issues are being quoted at about 50c, while strictly folded is going at about 30c.

The rag market is still lame from inactivity and uncertainty. Packers are generally agreed that conditions will improve in a few months, but they have not yet been able to feel any of this improvement. The mills are not buying stock in any great amount. All grades of rags are selling at prices, which certainly cannot allow of much profit. Imports of rags during the past few weeks have increased a little, but this fact

can hardly influence the market in any way. There is not very much of a supply of foreign rags in the United States, but so little of it has been in use that this fact is almost overlooked by all except the importers and packers. If good linens could be had, they would be easily sold, but there is not much of this stock about. Germany has placed an embargo on rags, which will, of course, eliminate any possibility of any more supplies from that source. Gunny bagging is being used chiefly outside of the paper industry, and is selling at $1.75 to $1.85. As the mill cannot afford to pay any more than about $1.20 to $1.30, it can readily be seen that they cannot enter the market. Old rope is selling well.

The actions of paper in this city have not been very encouraging. The mills for the past few weeks have been characterized by considerable falling off. A number of reasons are attributed to explain this, the most plausible of which is that the summer season is now under way, and its reaction is already being felt. Jobbers are buying very closely, and are not considering the handling of new lines. One large local jobber, who had almost completed arrangements to take in supplies of new brands, suddenly ceased his negotiations, and decided not to consider the matter further till early in the Fall. The mills are at a disadvantage because they are acting as bankers for the jobbers in that most of the big orders are of the "rush" sort, and almost invariably shipped "direct." Newsprint has not been showing improvement. The strike in Watertown has removed considerable tonnage from the market, but this has not been noticed. The summer months are generally poor, so it is not likely that the strike will have any visible effect on the trade. No big contracts have been reported. The keen competition to get what little business is to be had has not been conducive to getting better prices.

Side runs have weakened a little, and are not very much in quest. Tissue papers are still low. The cutting of prices is being practised without regard to any limitations. In white tissue, the market is at 40c to 40½c, but it is practically impossible to get business at this price. Quotations of 37½c are common, and it is even understood that lower figures have been used to close deals. However, this does not seem to have helped business. Manila tissues are selling at a poor profit. The mills report difficulty in getting coloring for these goods. Very little is being done with fibres and manilas. Manufacturers continue to shade prices to get business without any apparent avail. Krafts are in a poor state. Dealers complain of the lack of demand, but are incessant in their attempts to get business, and actually do not calculate whether a sale is profitable or not, so long as they get it. Paper bags are quiet. During the past few weeks a general 10 per cent advance was declared in the market. However, the dealers had replenished their stocks to good advantage during the previously hopeless condition of trade. While prices are now firm, that is about all. There is a general cessation of activities in this line during the summer. However, the prospects are fair, and prices are not deviating as much as in other lines. When the board market will "regain its feet" is still a matter of speculation. The mills are running at far from full time. The demand is weak and prices are being shaded freely.

That the general paper business will improve decidedly early in the Fall, is the consensus of opinion throughout the trade. The present lull in trade can hardly last longer than through the summer season, and it is this confidence that keeps the industry optimistic.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.75c to 1.95c, delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.60 to 2.90, ex dock, N.Y.
Easy Bleaching, impt., 2.15c to 2.20c, ex dock, N.Y.
Unbleached sulphate, impt. 1.80c to 2c, ex dock, N.Y.
Bleached sulphate, impt., 2.75c to 2.85c, ex dock, N.Y.
Kraft Pulp, 1.85c to 1.92½c, ex dock, New York.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

HYDRATED CELLULOSE OR LIGNOCELLULOSE MATERIAL,

(Continued from Page 373)

use of a solution of waste alkali that might be produced as by-product in industry such as soda pulp, sulphate pulp, of rubber recovery, the weak alkalinity being insufficient to effect any observable change in the fibre, other than the condition for hydration. Although a dilute alkali may be used, I have found that the hydration is greater when the alkali is associated either directly or indirectly with CS_2.

Having thus described my invention, what I claim is:—

The herein described product consisting of a cellulose or lignocellulose material treated with an alkali and carbon bisulphide, the proportion of alkali being such that the material will absorb approximately 2 per cent. by weight of alkali.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JUDSON A. DE CEW.

Witness:
STUART R. W. ALLEN.
G. M. MORELAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, WaWshington, D. C."

Ottawa Notes

Ottawa, Ont., June 25.—Some 4,500 cords of pulpwood have been cut out by the 2,000 odd interned aliens who are sequestrated in the big internment camps at Kapukasing and Spirit Lake in Northern Ontario and Quebec. About 1,000 acres of forest land have already been cleared at each camp and have been cut up into pulpwood or timber as the case may be and another 2,000 acres has now been set aside at each point for further clearing. It is considered likely that there will be a considerable settlement in these districts and that as a result of the war two new towns will spring up along the Transcontinental railway. If such is the case it is probable that a new pulp and paper industry may have its origin as a by-product of the desire of these new settlers to clear their land of timber.

The Ottawa Laurentian Chapter, Daughters of the Empire, has in contemplation a new method of raising funds to provide comforts for Canadian soldiers, the collection and sale of waste paper. It is proposed to gather such paper from business establishments and residents and sell the same to factories which use it as raw material. The services of the Boy Scouts will probably be enlisted in the collection of the waste paper and householders will be asked to save it till it is called for.

Mr. J. R. Booth, the wellknown local veteran paper manufacturer, made one of his very rare appearances in print, to urge the necessity of home defence in the present crisis. He pointed out that those who could not go to the front could well join the local militia regiments for training in case they should be called upon to defend life and property in Canada. It may be mentioned in this connection that a number of local lumbermen and paper manufacturers or members of their firms, have already gone to the front or are members of Home Guard units in this city.

The formation of a company of soldiers for the front to be composed entirely of lumber jacks has been made and is being prosecuted. Already many such men have formed members of various expeditionary force units but the present plan is to organize them into a separate company in connection with one of the two new regiments which it was recently announced would be raised in this military district.

The statement that the Reid railway interests in Newfoundland had prevented the establishment of a large American pulp and paper plant in that colony was made by the Ottawa Citizen last week. The citizen editorially states that the Deer Lake Company, backed by United States capital, had raised $7,000,000 to build a plant at Deer Lake similar to that which is now in operation in Grand Falls. When the company sought to buy the necessary land and water rights, however, it found itself held up for exorbitant figures, $1,250,000 being demanded. The American syndicate thereupon refused to accept these terms and the proposal fell to the ground. The statement was made in the Newfoundland legislature that some 2000 men were thus deprived of employment and the Reids have been sharply criticized in connection therewith.

TENDERS FOR PULPWOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway west of Lac Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council, for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near that territory, and to manufacture the wood into paper in the Province of Ontario — the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,
Minister of Lands, Forests and Mines, Toronto, June 5th, 1915.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XIII. **MONTREAL, JULY 15, 1915** **No. 14**

Better Business

A car running on a surburban line pulled into a city station one Saturday noon. On the platform were forty business men, ready to go to their homes for the week-end. Hardly before the car stopped, there was a rush for the rear door, and in the ensuing thirty seconds, toes, shins and elbows were bumped liberally. Moreover, the temper and pride of several individuals suffered severely. Forty men, each one with a lingering sense of the injustice of thirty-nine others seated themselves, and sixteen seats remained unoccupied.

There was room for all. All these men knew it. If they did not, their sense of proportion and their knowledge of the car's capacity were unworthy of them. Still, they crowded and pushed, and made themselves and others uncomfortable.

Awaiting the next car were forty men going out to a golf tourney. There was just as much occasion for haste for the car was due to leave promptly. But the golfers were good friends; they were polite. No crowding, no injured feelings, no sense of resentment. Everybody knew there was plenty of room; or if not, any, or all of them were willing to stand for a while.

What a wonderful thing a sense of comradeship is! What a host of trials it lifts! What a vast number of minor difficulties it dissipates!

The lesson of the street car can be carried into every walk of life. It bears upon industry in particular. In the mad rush for wealth and position, men seem to forget that their companions are really the main interest in business. Commerce and industry would be utterly dull were it not for pleasant relations, and a sense of esteem from one's fellows.

And how do we fare in pulp and paper industry? Are we "rushing for the street car"? Let us consider well the words of a man who has been honored with the confidence of the people of Wisconsin. Mr. John Strange, of Menasha, Wis., has written us as follows:

"I think the most needed reform in the paper industry, is the need of a higher and more consistent standard of marketing the products of our mills.

Heretofore, paper manufacturers have looked upon each other as opponents, and even enemies, than as friends, having, in truth, a common interest.

For thirty years, I have, at frequent intervals, attended meetings of the manufacturers and dealers in paper, at which meetings efforts were made to increase the possibilities of success through legitimate and lawful ways, and I have heard many interesting addresses, and have been a party to the adoption of a multitude of good resolutions, but up to the present time I an not able to fix my mind upon a single feature which has been materially improved through the meetings referred to.

If we, as manufacturers and merchants in the paper industry, could bring about a standard of ethics which would be strong enough to guide us in out conduct outside of such meetings as I have referred to, I believe that much good would follow.

The spirit of unjustifiable and disastrous competition, which has generally prevailed in our business, has rendered it quite impossible for the ordinary mill to succeed.

If the paper manufacturers could be prevailed upon to see the wisdom of working together—not only for a reasonable profit, but to avoid disaster—if they could trust each other implicitly, and be worthy of that trust; if they could, and would, in fact, be wise in recognition of the truth that the interests of all are common, and that true friendship and perfect fairness should control our conduct, much would be

accomplished in the way of making our business strong, and worthy, and successful.

Getting together in the spirit of good fellowship, and working with all our mights to make the paper industry a business founded upon honor and fairness, should appeal to us all. 'All for each, and each for all,' might well be taken as our motto."

We can rely upon it that Mr. Strange is not a pessimist. He is hopeful and enthusiastic for co-operation, even after thirty years of what he believes to be indifferent results in co-operation. Nor, we feel sure, is he alone in his desires. Many other men, while they may not be able to state their views in as convincing a manner, hold that comradeship, and the trust of their fellows, is the greatest of all rewards in business life. As a rule, under even fairly good conditions, the business man who is esteemed by others is successful in other ways as well.

So, in boarding the Street Car of Paper Sales on the road of Success, let us not have a wild scramble for the door. Some people may say "There isn't room for all of us, and I am not going to stand aside." Well now, let us drop the simile, and talk of actual conditions.

The demand for paper is low—at the present moment it is probably at its lowest in many a year. Keeping mills going is a problem which is besetting many manufacturers. Some go so far as to say that it is necessary to sell at almost any price, in order to pay wages. The cutting goes on with losses to everybody, and injured feelings to many.

Now, how much better to be patient, avoid the rush of cutting, and concede a little in favor of our good friend, the next-door manufacturer.

Such a thing as monopoly of markets does not exist. Good democratic people that we are, we do not want any such thing. And good sensible people that we are, we rarely overcrowd an industry. There is a market, or there can be created a market, for practically everything that is produced. Only, when there comes a pinch, and production seems high compared with consumption, we had better remember that comradeship is better than tooth-and-nail competition. Good fellowship is far from being unlawful; it is business-like, gentlemanly, and the best policy in the long run.

Mr. Strange hits the nail on the head when he discusses one of the reasons for the unpleasant situation in the pulp and paper industry. He says:

"There is another thing which has been unfair to the paper industry, and to the public, and that is the impression which has been allowed to get into the public mind, that the paper industry, so far as the manufacturing end is concerned, has been unusually profitable.

So far as my own observation has extended, I [illegible] that in other branches of manufacturing [illegible] as little net profit for [illegible] and the work required, and the number of hours involved, as has the paper business. Not more than one-half of the mills in Wisconsin, have, as a matter of truth, been what any ordinary business man would declare profitable, and taken as a whole, the mills have not paid the prevailing rate of interest upon the money which has been invested in the mills. The promoter has generally misled the subscribers to the capital stock of new paper mills, and the public misunderstanding has contributed towards the promoters' success, all because the truth has not been understood."

That the pulp and paper industry should have been the victim of the over-enthusiastic promoter or the slick financier, is indeed deplorable. The Canadian industry knows to its cost what evils have been brought upon it by "finance." Indeed, if there were some readjustment in the industry, similar to that which the war has wrought among inflated enterprises in the world at large, great advances would result.

It is not for the officers of the pulp and paper mills of the country to say who shall, or shall not, come into the field, but the investing public, by exercising a proper discrimination, can discourage those enterprises which are unsound.

Says Mr. Strange in this connection:

"It ought to be a reasonable thing to bring about an organization of the best and soundest owners of paper mill stocks for bringing the business up to a higher standard, and eliminating the errors and dangers which have so largely existed in the past.

There has been much misunderstanding, and a great deal of error connected with the investment in pulp and paper mill stocks, and only legitimate, fair, wise and conservative means should prevail in building up any great industry."

One of the foremost newsprint manufacturers in the United States has suggested that prominent shareholders in each company be invited to attend at least one day's sessions of the national associations, and so bring about a greater degree of trust, understanding, and goodwill between the manufacturing and stockholding interests.

This would undoubtedly have a highly beneficial effect. Mr. Strange is kind enough to say that he thinks that: "The Pulp and Paper Magazine and the paper trade magazines of our own country have it in their power to do a great deal of good for the industry, and through that aid tender a substantial protection to the investing public, who have no practical knowledge of the pulp and paper industry."

The Pulp and Paper Magazine is sure that trade journals will welcome the opportunity to perform the service of which Mr. Strange speaks. We should consider it a privilege to put into print the ideas of other leaders in the industry, meanwhile we would express sincere gratitude to Mr. Strange for giving expression to his mature thought.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited

Pte. CHRISTOPHER H. "CHARLIE" DAWSON—Princess Pats. Killed in Action February 28th, 1915.
Pte. WM. SMITH—1st Brigade Field Artillery, 2nd Battery.
Pte. WM. DONOHUE—1st Brigade Field Artillery, 2nd Battery.
Corp. EARL J. WILSON—15th Battalion Highlanders. Recommended for Distinguished Service Medal. Severely wounded at St. Julien.
Pte. GEO. ALBERT BROWN—Signaller 15th Batt. Highlanders.
Pte. C. V. PERRY—Borden Battery.
Sergeant-Major E. C. MORRIS—23rd Reserve Battalion, Canadian Expeditionary Force.

Bird & Son

JAMES BOATH.
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company

Lieut. A. H. REIFFENSTEIN

Campbell Lumber Company Limited

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL
Lieut. GLIDDEN CAMPBELL

La Compagnie de Pulpe de Chicoutimi

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford & Company

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.

Kinleith Paper Company Limited

CAPT. C. STEWART-PATTERSON, Paymaster 19th Battalion, 2nd Con't.
GEOFFREY GRAHAM—7th Field Battery.
BEN ASHFORD—7th Field Battery.
A. DAVIES, English Reservist with his Regiment.
B. BARNES—English Reservist with his Regiment.

The Laurentide Company Limited

M. JEAN ARHAN—French Reservist with his Regiment in France.
M. FRANCOIS DURCHER—French Reservist with his Regiment in France.

Price Bros. & Co. Limited.

G. C. DRURY.
E. C. CULLING, missing 23 April.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. BERNIER.
R. AMY, Jr., killed 31st May.
E. LEDGER.
H. A. MOAT.
J. C. EAGLES.
J. HOOD.
S. HARTLEY.
G. LANE.
R. DONCET.
C. CONLEY.
S. LAPIERRE.

St. Croix Lumber Co.

FRED BOUCHY—1st Contingent.
BERT McMULLEN—25th Regiment.
CLIFFORD WHEADON—25th Regiment.

St. George Pulp and Paper Company

HARRY HEWITT
GORDON GRAY.
ROBERT GRAY, JR.
ARTHUR HATT.

Spanish River Pulp and Paper Mills Limited

L. FINCH.
W. P. L. FOOT.
OLIVER DENMAN.
M. L. COTGRAVE.
E. COLLINS.
C. MARTIN.
HOWARD N. REID.
P. VENN.
GEO. WICKENDEN.
HAROLD LOCKWOOD.

Toronto Paper Manufacturing Co., Ltd.

ALLEN FORBES.
JOHN GIRARD
MIKE COLBORNE.
Z. MARTIN.

Jean Arhan
Brigadier, 51ième Artillerie, 4ième Batterie.
A Nantes (Loire Inférieure), France.

François Durcher,
Soldat 318ième d'Infanterie, 23ième Compagnie,
(Quimper, Finistère), France.

Pte. Donald Rhéaume,
First Contingent.

Sgt. Major E. C. Morris,
23rd Reserve Battalion.

[illegible] by no means complete and will be added to as further information is received. Friends of soldier [illegible] who have enlisted are urged to send in names, [illegible] and news items. Copies of the Pulp and Paper Magazine containing photographic references will be sent to relatives upon request.

Pte. Janvier Brisbois,
22nd Regiment.

THE CHART SYSTEM

By D. V. McSWEENEY

Gres Falls Company, Cap Madeleine, Que.

(Written Specially for Pulp and Paper Magazine)

A few years ago, an American paper company which imported nearly all its wood from its Canadian shipping point, had considerable difficulty in determining the amount of wood being loaded, and the amount in transit. The wood was loaded in barges in Canada, then taken by tugs through one of the lakes, then unloaded by conveyor and shipped to the mills by car, a distance of twenty miles. To determine the number of boats loading, waiting to be loaded, boats in transit, empty cars, at the lake port, cars in transit and empty cars at the mill, kept the management quite busy, in fact, so busy that the wood problem received the most attention. It was only when the chart system was installed that they knew where they were at.

A drawing was made of the river, lake, railroad and receiving port, and pin clasps, with cards inserted, giving the name of the boats and car numbers, etc., were employed to show their location daily. Upon information received by mail or telephone from the different points, the cards were changed to agree with the conditions and it took but a glance at the cards to ascertain where the empty boats, the loaded boats, the tugs, and the empty and loaded cars were located. The receiving point knew the number of boats being unloaded at the lake port and the number of cars in transit. The crew to unload were on hand at the proper time and the saving in money, time, worry and trouble was great.

All information that is of any value in the pulp and paper industry can be kept on charts. The main reason why charts are of so much interest, is that they are the simplest method of keeping costs, the simplest way being the best providing the desired information is given. There is no time lost by the manager having the books or cost records searched through to obtain any comparison between the different months or the different years. A glance at the charts will impart the desired information and the impression obtained will not be forgotten as soon as the figures obtained from the books.

Many pulp and paper companies keep charts for the tonnage, shipments, labor costs per ton, etc. but the system can and should be extended further than this. There is no doubt but that beneficial results will be obtained. Leaks will be found and in the future they will be avoided.

At the present day, with so much competition in the field, paper companies have to figure closely. Other conditions being the same, if one pulp or paper manufacturer can manufacture the product $1.00 per ton cheaper than a rival company, then he is in a position to sell his product $1.00 per ton cheaper and while the loser is mourning his inability to sell his product, he might have economy the watchword in all the departments of the mill and the $1.00 per ton might not only be saved, but he might turn out a product cheaper than the mill which previously handicapped him.

By installing the chart system for tonnage, shipments labor per ton (not only the total, but the labor for each important department), supplies, fuel, repair labor and repair material (subdividing same as much as possible), felt records, oils and lubricants, wood costs per ton, yield and innumerable other items, the mill management will not only become enlightened, but will become interested in keeping the costs "down" more than ever before. After a trial it will readily be seen that each chart will act as a guide of incalculable value.

The various accounts, such as repair labor, repair material, supplies, etc. should be thoroughly subdivided in order to ascertain where the work is being done and the material used. For example: supplies may cost 10c. per ton at a plant. Perhaps if the cost per ton for the three preceding months were 9c., 9 3-4c. and 11c. then many are satisfied, but one should know the articles which make up this cost of 10c. per ton. The amount for a 150-ton plant is $15.00 per day, perhaps $350,00 per month. Upon a subdivision at the end of the month, one may find that the lamps cost $60.00, lubricants $145.00, brooms $14.00, twine $22.00, etc. The remaining 109 dollars is made up of numerous other items which do not seem excessive. In going over the matter, thoroughly $60.00 for lamps appears to be rather high. An investigation is made and it is found that no one really knows why so many lamps are used. One department where the foreman is careless the reason given is that the lamps are worthless. In another department the foreman is careful and the lamps are found to give very good service. One contradicts the other and a tally is kept of the lamps. Economy has begun and the cost the next month for lamps has dropped to $35.00, and in the future goes still lower.

In one mill, by making the men return an old broom for every new one which they received, the cost of brooms were reduced by over 50 per cent. The old brooms were given to the men who worked on the barkers and were entirely satisfactory for that department.

Any system that can be conceived tending to increase the output or diminish the cost of material or labor at any plant should be accepted by the industry. A few cents per ton saved here and there amounts to a large item per year. "**Safety First**" is an admirable slogan and should be followed by "**Economy Next.**" The former insures against accidents and the latter against loss. Economy can and has been practised without charts as a guide, but they will prove to render assistance and greater results will be obtained.

Curtailing costs is undoubtedly a difficult matter. The management may say "We are running as close as possible and nothing is wasted," but until cost records are subdivided more than is usually the case for mills, leaks will exist and may be overlooked for years.

At a plant where pulp and paper is manufactured (the pulp being made into laps) charts are kept for cost of wood per ton, yield per cord, moisture test, per cent of shrinkage, etc. During a few months of the year the cost of the pulp shows a decrease and the cost of the paper had increased due to the high per cent of shrinkage.

From a study of the chart it will be seen that the moisture test for the pulp has been higher than usual, the yield per cord has been higher, the cost of the wood

lower, due to the high yield. At the paper mill, all the conditions are the same, with the exception of the shrinkage and this has been excessive. The reason is obvious. The test has been too high and the paper mill has been charged with pulp which has never been received. Without the chart, the superintendent might have to account for the high shrinkage and he can give no plausable explanation. A study of the chart explains all.

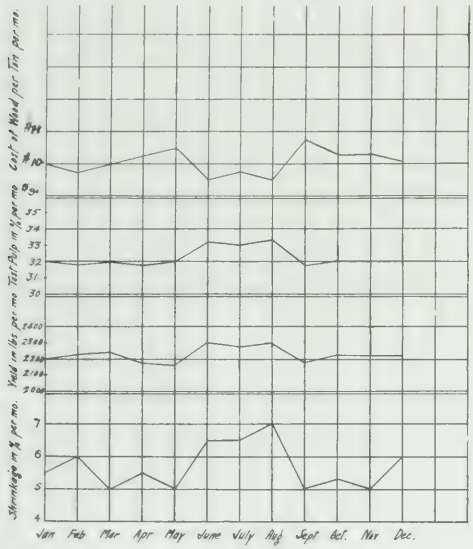

Chart A.

Chart No. 1. This chart represents the cost of belting per ton for a sulphite mill. The dotted line shows the cost per ton during a year when the foreman helped themselves to belting, no records being kept of where the belts were used. Moreover belts were improperly put on, as a result of these conditions the belting cost per ton has been rather high. The continuous line shows conditions the following year, when a strict

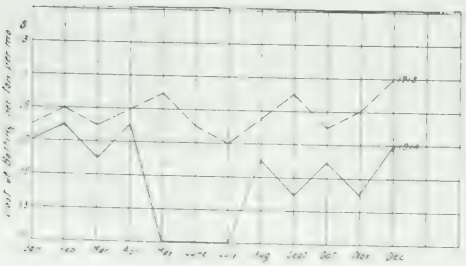

Chart 1

kept of all the belts used. The belting was under charge of one man and was frequently inspected. All belts were properly cut and the proper size of hooks used. The old belts taken off were saved, sent to different widths and put where they could be used to advantage. Three months during the year (May, June, and July) no new belts were delivered. The saving for the year was a very large item.

Belting is an important item in every mill. Yet, it is an account that is oftentimes neglected. To secure good results from belts, the same must receive proper attention. Whenever a belt broke at this mill, the reason was ascertained. If it was the fault of the belt it was condemned. If the belt was torn at the hooks, they having been put on wrong, the foreman was held responsible and if the shafting was "out of line", it was one of the jobs of the mechanic to "line up" as soon as possible. The one noticeable fact at this plant, was that the belts taken off were worn out, ply for ply, whereas previously the belts were generally pulled out at the hooks, either by their not being squared when put on, or to the use of the wrong size of hooks. The saving per year on belting is an item that can be figured. The loss in time when the machinery is down to allow belting to be repaired or changed is a more difficult problem.

Chart No. 2. Represents a monthly pay roll in a mill. Despite the fact that the production of the mill has been

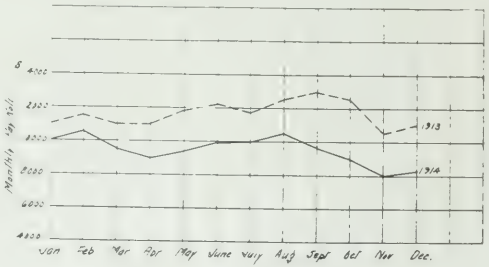

Chart 2

increased 25 per cent (which implies more help), and that wages have been increased, still the chart shows a saving in wages of over $2,500 per month. The saving has been due to the elimination of unnecessary labor. Conveyors have been installed, decreasing the crew. The pay roll increased during the summer months due to the fact that during these months the winter's wood is piled in the mill yard. By a system-

Chart 3

atic method of handling the help and by the installation of labor-saving devices the cost of labor per ton of product has been decreased over $1.00 per ton.

Chart No. 3. This chart shows the number of brooms used per month at a plant. This may be a very small account, but it shows that the system is adopted for both large and small items at a mill. When the mill

foremen became aware that an account was kept of the brooms, who took them, and in what department they were used, etc., they made the brooms last longer as can be seen by the chart.

Chart No. 4. is a comparison of sulphite felt records for two years. Each point in the curve represents the average number of days for all the felts taken off during any particular month. The same make of felt has been used during the two years. One superintendent was satisfied with his felts if they lasted on the average 15 days. During the year accidents to felts were frequent. They were torn by bolts on whipper bars, and on suction boxes, but mainly by the boys letting the pin go over the roll. The press tenders would "visit" and the sheet would get so thick that in trying to cut the lap they would lose control of the pin which would tear the felt beyond repair. The record of the following year (the continuous line) shows the average number of days of service obtained by another superintendent at the same plant.

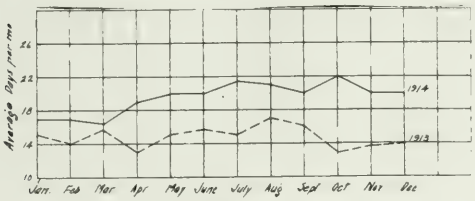

Chart 4

After the second or third month the average ran 20 days or over. Each morning all the felts were inspected, and during the year there was an absence of accidents due to presses plugging, tears by pins, etc. In addition to the extra service given by the felts, the production per wet machine had been increased from 3 to 4 tons per day.

Chart No. 5 represents the repair labor per month at a pulp mill. The average for one year is $1,200 per month. During this period, the head mechanic is paid by the hour. The crew is large and plenty of overtime is made by each of the millwrights. The principle of the crew was to make all the extra work they could and to make all jobs last as long as possible, with the exception of times when the mill was down by a "break-down".

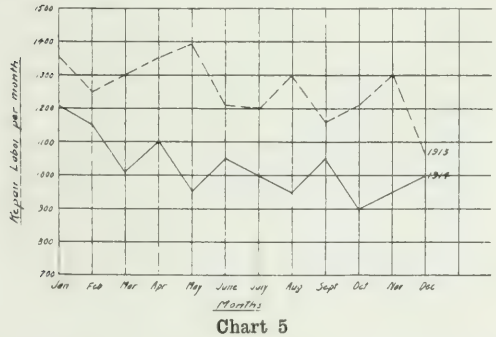

Chart 5

The following year a new principle was inaugurated. The master mechanic was put on a salary and was expected to remain on the job until it was finished. Naturally he allows no loafing by the crew. In addition to this the crew has been diminished. The chart shows the saving.

It should be borne in mind also that although the saving for repair labor has been large, the saving in material has been much larger for it is a poor mechanic that will not use during the day, material of twice the value of his salary.

Chart No. 6 shows the comparison in the cost of lamps for the years 1913-1914. During the year 1913, there was no record kept as to the number of lamps used, where they were used and whether the proper lamp was put in the proper place.

Chart 6

Perhaps during this year a 100 Watt lamp was installed in a place, where only a 16 C. P. would be necessary. The following year a record was kept and the cost per month decreased by an average of $15. This is not a large amount, but is well worth while looking into. The one good feature of the chart is that when one ascertains how high the cost has been for an account, sees how low it has been cut, it is doubtful if he will ever let the costs reach the high mark again.

Chart No. 7 represents the cost of lubricants per ton. In the year reresented by the continuous line the cost per ton has varied from 3 cents to 6 cents. During July, August and September no record was kept of the lubricants used, the system having been abolished. The men "helped themselves" to oils and grease, etc., and the cost per ton for this period rose 2 cents per ton. During the months of November and December the system was again put in effect and the saving is plainly recorded on the chart.

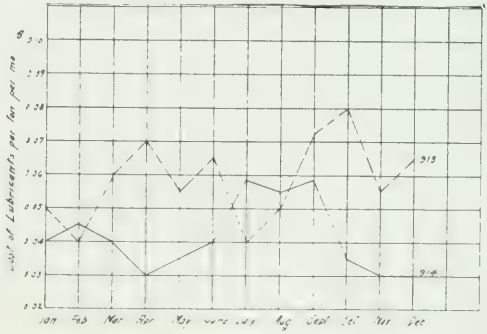

Chart 7

Chart No. 8 is a record of the cost of supplies per ton at a mill. As this account is made up of such material as twine, lamps, brooms, etc., the saving per ton is not a large amount. The year in which the chart has been kept makes the best showing and a

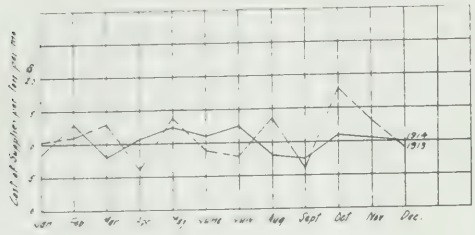

Chart 8

saving of a few cents per ton amounts to a large item for a year.

Chart No. 9 shows the cost of repair material at the plant where the saving was made on repair labor (chart 5). During the first few months the repair material is higher than in the preceding year, but the following months show a great saving. There are months shown where the superintendent has saved his year's salary on this single account. In addition to this the production of the plant has increased 25 per cent and the condition of the mill is much better than in the preceding year where all accounts were much higher. The saving of repair material has been made in every possible manner. The mill is a large one and naturally there is plenty of old material in stock. If a chip conveyor belt has worn out and the cost of a new belt would be $400 the superintendent would install a chain conveyor using detachable chain costing much less and serving the purpose as well as a belt. When the chain partly wears out, the chain is replaced and the old chain used for the wood conveyors in the yard or the ash conveyor at the boiler house. These

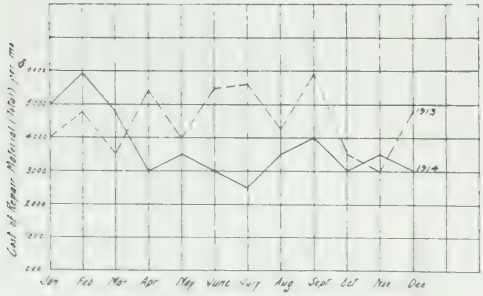

Chart 9

conveyors are not so important and the old chain can be used until quite valueless. Inspection was frequently made of all the machinery of the mill and instead of waiting for a "breakdown" (which decreases the production) the superintendent would replace pulleys or gears, put shafting in line, take up or repair belts and generally to do everything to save ordering material and keep production at normal. The chart shows in addition to the increased production, a large saving in repair material.

Chart No. 10 represents the saving figured in cost per ton of wet machine cylinder wires. Old paper machine wires have been used, which have served the purpose as well as new wires. After all cylinders were covered they were inspected by the superintendent. This inspection insures a good job by the man who sewed on the wires.

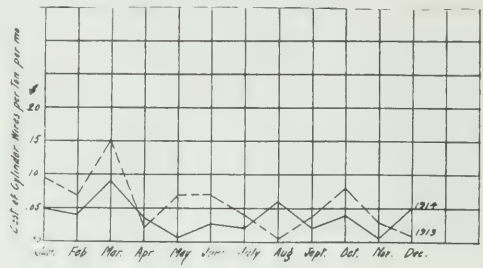

Chart 10

Chart No. 11 represents the yield of sulphite pulp per cord in two successive years. The increase in yield is due to uniform chips, expert cooks (who never allowed a cook to be run into the river, as had been

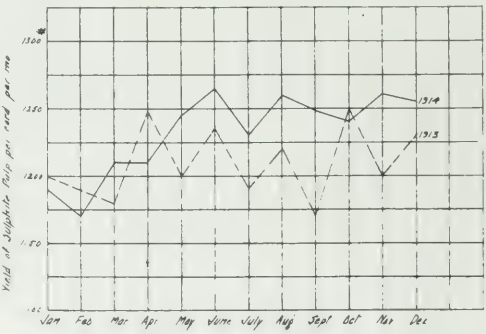

Chart 11

the case oftentimes before), uniform stock and the installation of a save-all which saved over a ton of stock per day.

Chart No. 12 shows the number of cooks per half month. The extra number of cooks has been secured,

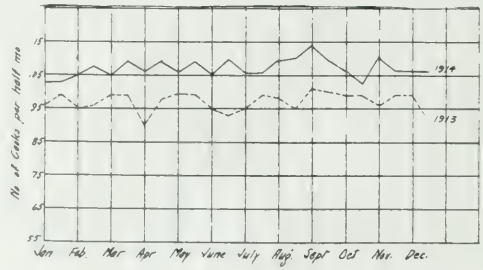

Chart 12

not by shortening the time of each, but by watching the entire system, making the proper acid, decreasing both the time in filling the digester with chips and acid,

eliminating the time lost by digesters "liming up" and having the steam furnished when desired. In the last year, 1913, few weeks had passed without digesters losing time by "waiting for acid," "short of steam," "digester limed up," etc.

The dotted line in Chart No. 13 represents the cost of belt fasteners at a plant. The cost ran up from $15 per month (January) to $25 (July). Plates were given to the different departments by the box—and

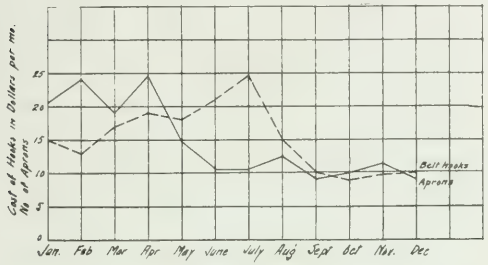

Chart 13

were wasted. Beginning with the month of August, the required number of hooks were supplied when the belts broke, or a new belt was to be put on. The continuous line represents the number of aprons furnished to barker men at a plant who had an agreement to furnish aprons to the men. During the month of April, the superintendent detected when a slight hole appeared in the apron the men had the habit of tearing it purposely in order to secure a new one. Immediately after the number of aprons delivered per month decreased over 50 per cent.

Chart No. 14 represents the number of gallons of dynamo oil delivered to the electrical department during the year. The following year, the oil was strained through cheesecloth and used over. The saving as shown was considerable.

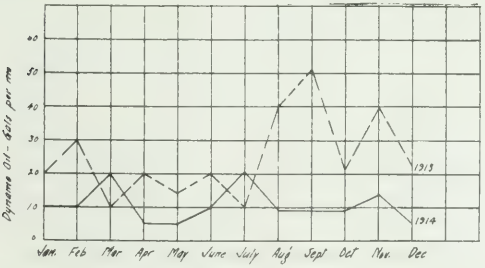

Chart 14

When such a practice is once adopted, it is naturally followed up in all the departments of the mill, acting as an endless chain and inducing all to become economical. It is a good idea occasionally to give the mill foremen a lesson in the system, explaining how it is kept. The ordinary mill foreman will become interested, and when shown how high his department is running as to the cost of lamps, brooms, oils, repair labor, or repair material and how low it was operated for a few months previous to this, he will do the utmost to bring the costs down to the normal figure

At a plant where the foremen were informed of the price of the material which they used, they became so interested in keeping down the cost of their department that at one time when some piping was to be done and the measurement was being taken for the pipe, elbows, etc., one foreman remembered that in the mill basement where there was a discarded pipe line containing not only all the necessary pipe, but the flanges, elbows and couplings. The fact that the foreman was interested saved the company in the neighborhood of $40.

The charts shown in this issue are but a few, and are mainly given to show the different items for which the charts can be kept. The more charts kept, the more information obtained and hence the more opportunities for economy.

For groundwood mills, in addition to those sketched, charts may be kept for tons per stone, H. P. per ton, yield per cord, grindstone per ton, packing, burs, screen plates, different grades of oils, etc. For sulphite mills interesting charts can be followed for limestone per ton, sulphur, number of cooks, yield, tons per cook, etc.

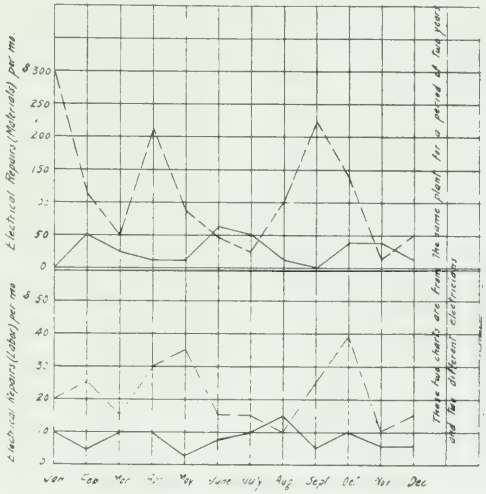

Chart 15

For all mills, one of the most important charts is one which keeps a record of the shutdowns and the reasons for them. This should be subdivided for the different departments, wood room, grinder room, boiler house, sulphite plant and paper mill. To determine if one plant is down for broken shafts, broken belts, sewers plugged, electrical or steam trouble, lack of acid, raw cooks, etc., and the length of time shutdown for each particular trouble would be of considerable interest. Not only is such information of interest, but if the reasons are investigated perhaps many a shutdown will be avoided in the future.

A superintendent in taking charge of a large sulphite mill searched back all the production records for a year and found the reasons for low production, caused mostly by shutdowns, were as follows: digesters waiting for acid, waiting for steam, waiting for chips, belts breaking, digesters "liming up," sewers plugging and lastly broken shafts. It took but a short time to remedy the acid situation. Not only was the acid supplied when required, but a larger amount was produced with fewer tubes and burners in operation. The

acid makers were so used to being short of acid that it had become a custom.

Steam was supplied regularly and thereafter there was an absence on the production report of "waiting for steam." Chips were supplied by installing an extra chipper and while the knives were being changed, the other one was started, it also being operated when required.

The belt situation was remedied. The men were taught how to put on a belt; belts were frequently inspected and the proper kind of belt used in the proper place. The "lining up" of the digesters became a trouble of the past.

The mill ran week after week without a "slip," the production increased from 20 per cent to 35 per cent (a high figure) and the company profited by the wide-awake superintendent. At the present time the plant is one of the leaders in the country.

The cost of installing the system is small. After the costs per month have been found for all the accounts as far back as one wishes to go, for comparison, the keeping of the chart is a job which requires but a few hours per month. The main thing is to study the charts and to avoid all errors which have been made in the past.

Soluble Cellulose Products

By EDWARD KELLEY, B.S.
Engineering Chemist for the City of New York

(Written Specially for Pulp and Paper Magazine)

Guncotton was the first substitute for silk used, and although amyl acetate is the best commercial solvent, strong alcohol seems the best for the purpose, as where the solution is spun the usual coagulation with water is easiest effected, due to the ready solubility of the alcohol in water. The great difficulty with guncotton (pyroxlin) is in inflammability. Since the introduction of viscose by Cross, Bevan and Beadle, the use of guncotton has not progressed. The chief objections to cellulose fibers made by reversion of viscose are the color and odor. Its chief use is for artificial leather, for which application is coated on cloth and embossed. For light colored goods it may be bleached, which injures its strength. By treating the alkali cellulose with sodium bisulphite and zinc oxide before treating with carbon disulphide both objections are said to be removed. Substances well adopted for the manufacture of artificial silk are cellulose esters, such as acetyl cellulose.

Until recently, very little progress has been made with the artificial product for cellulose dissolved in cup ammonium hydroxide, due largely to the resistance of the cellulose article to the reagent. This is softened, however, by means of the action of the caustic alkali (mercerization), but recently it has been found possible to get strong solutions which can be quickly prepared as follows: "162 grams of dry and finely divided cellulose are thoroughly mixed at ordinary temperature with a solution of 80 grams pure caustic soda in 500 grams of water. After the mixture has been allowed to stand for an hour or so, 249 grams of [illegible] powdered copper sulphate are incorporated into the mass. It must be added slowly to prevent any marked rise in the temperature. A homogeneous bright blue product results; this is known as copper-hydrate-cellulose, and is soluble in concentrated ammonia, and is available for the production of threads, or as a coating for textiles." Alumina and calcium and zinc oxides have been used to replace the copper after having been prepared in some cases in an analogous way.

Cellulose has also been dissolved in basic nitrate and chloride of zinc. In these cases the solution is used warm, while with viscose, cellulose acetate, and the cuprammonium compound heat is avoided. The difficulty met with is that at the high temperature, the weak hydrocellulose is formed.

To Stimulate Research

The Technical Section of the American Paper and Pulp Association has made the announcement that, being anxious to bring about advancements in methods of manufacture of paper and pulp and, with a view of concentrating attention one some of the more important problems before the American pulp and paper manufacturers, it offers a prize of one hundred dollars ($100.00) for the best paper on each subject in the list given below. It is expected to offer similar prizes each year. This competition is subject to the following rules:

1.—The authors of the papers presented must be residents of the United States or Canada.

2.—The papers are to reach the office of the Secretary of the Section on or before December 31, 1916.

3.—Each paper must be typewritten and must not bear the author's name or address. Instead of the author's name the paper shall bear a number or other designating character or word. Accompanying the paper shall be a sealed envelope containing the author's name and address and the number or designating character by which the paper is characterized.

4.—Papers presented in this competition must not previously have appeared in print.

5.—The determination of the papers winning the prizes shall be made by a committee of three appointed by the chairman of the Technical Section. This committee shall publicly report its findings to the Section at the time of the Annual Meeting next after February 1, 1917.

6.—In case papers are not of sufficient merit, the committee shall have the right to omit the bestowal of the prize on any subject for that year, the subject to be carried forward at the option of the committee.

7.—All papers received shall be returned to their authors soon after the announcement of the winning paper.

8.—The articles winning the prizes offered shall be published in the Report of the Organization and also in "Paper," the official journal of the Section.

List of Subjects.

1.—The various causes for the deterioration of the Fourdrinier wires and steps to be taken in the prolongation of the life of the wires.

2.—How can the pitch in sulphite pulp be eliminated?

3.—The effect of the order and time of adding alum, rosin and color on the retention of color.

4.—The retention of the various mineral fillers used in papermaking and their effect on the life of the machine clothing and the quality of the paper.

A DESCRIPTION OF THE COURSES IN PAPER MANUFACTURE AT THE UNIVERSITY OF MICHIGAN

By JOHN D. RUE

Assistant Professor of Chemical Engineering, University of Michigan.

During the last few years rapid strides have been made toward the establishment of centers of scientific research for the development of the natural resources of this country and Canada which bear upon the production of pulp and paper. Men, too are now being trained in the fundamental principles underlying the manufacture of paper. The value of the Forest Products Laboratory at Madison, Wis., to this branch of industry has already been amply demonstrated. The Canadian Government has gone far in the development of a similar enterprise. In February, 1913, the University of Maine offered the first course in papermaking ever given in the United States. Graduates from this course are already finding places in the industry.

The manufacturers are beginning to realize the value that men with broad technical training have in their business. Their sentiment was well expressed in the resolutions passed March 1, 1915, by the American Paper and Pulp Association, in which approval was given the action of the University of Maine and the establishment of educational facilities for prospective paper men encouraged in other institutions. A willingness was expressed to cooperate with these institutions by offering employment in the mills to students during the vacation months, so that the theoretical training might be supplemented by sound practical experience in actual manufacturing methods.

Some of the Michigan mills have gone a step further. Henry E. Fletcher, of the Fletcher Paper Company, and chairman of the executive committee of the Technical Section of the American Paper and Pulp Association, initiated the idea that the manufacturers contribute to a fund to be used to establish Fellowships in Paper Manufacture at the University of Michigan. The following mills have contributed to such a fund: Fletcher Paper Company, Alpena; Peninsular Paper Company, Ypsilanti; Port Huron Paper Company, Port Huron; River Raisin Paper Company, Monroe, Detroit Sulphite Pulp and Paper Company, Detroit; Central Paper Company, Muskegon.

One fellowship has already been established with five hundred dollars to the holder, who must be a graduate student and devote an entire year to the study of the manufacture of paper and to the investigation of some important problem connected with this industry. The fellowship has been awarded for next year to F. E. Ford, of Tecumseh, Mich.

There is little doubt that the establishment of this fellowship will increase the interest and number of students who will seek to avail themselves of the opportunities offered to prepare themselves to take a leading part in placing the industry on a more strictly scientific basis.

The University of Michigan believes that its function is to train men who shall be broadly and thoroughly educated and not merely trained in technical processes by rule-of-thumb methods. It is glad to cooperate with the paper manufacturers of the State in establishing a course in paper manufacture in accordance with this principle.

The foundations for such a course are already laid. The professional courses in chemistry, chemical engineering and forestry offer the preparatory courses. The engineering building, the chemistry building and the science building have all been erected within the last ten years and together represent an outlay of upward of one million dollars. Their laboratories are well equipped for general purposes, and special equipment for the manufacture and testing of paper and pulp will be installed as rapidly as possible. A considerable advance has already been made toward collecting a complete library dealing with pulp and paper technology and related subjects. The library is now a regular subscriber for the Pulp and Paper Magazine, Paper, The Paper Mill, Papier Zeitung, Papierfabrikant and Wochenblatt fur Papierfabrikation. The library of the chemical laboratory contains eight thousand volumes dealing solely with chemistry and its applications, and receives eighty journals regularly. It is exceptionally rich in complete sets of the older chemical journals.

The course in chemical engineering seems the logical one on which to build the professional courses in paper manufacture. It already includes several courses having a direct bearing on the subject. The manufacture of acids, alkalies and bleach is studied in one course, and a brief study of cellulose, fibers, bleaching, dyeing and papermaking is included in the course on technology of organic compounds. A further opportunity for specialization is allowed in the course in special problems, where each student makes a close laboratory study of some particular problem which he selects. Thirty-eight students graduated from the course in chemical engineering in 1914, so that there will be no lack of material from which to draw. Students following a general science course, the course in chemistry or the professional forestry course may also become interested in papermaking.

The committee of the contributing paper manufacturerswill cooperate with the university committee in planning the best course for students desiring to specialize in this branch of technology. The following is an outline of the preparatory courses of study already offered at the University of Michigan, which will serve as a basis for the development of a paper course:

Present Course in Chemical Engineering at the University of Michigan.

(a)—Preparatory Courses	Hours
English	6
Modern language and cultural electives	16
Mathematics	16
Physics	10
Chemistry:	
General and qualitative analysis.	10
Quantitative analysis	8
Organic chemistry	9
Theoretical chemistry	3
Shop work	4
Descriptive geometry	4
Total hours	86

In "Paper"

b Engineering Courses	
Surveying	2
Mechanics and strength of materials	7
Mechanism and machine drawing	5
Heat engines	4
Electrical machinery	4
Chemical engineering:	
Building materials	3
Fuel utilization and tests	3
Salts, acids and alkalies	2
Metallurgy	2
Technology of organic compounds	4
Special problems	5
Total hours	41
Preparatory courses	86
Engineering courses	41
Elective courses	13
Total required	140

Special courses dealing with the various phases of papermaking will be provided as the number and needs of the students develop. The schools of Engineering and Forestry at the University of Michigan are among the largest in the country and the announcement of a fellowship in paper manufacture is already directing the atention of ambitious students to the opportunities afforded in this direction.

Investors in Pulp and Paper

In relation to the pulp and paper industry there is no more important feature than the preservation of the forest reserves which provide the raw material. Keen competitio nof curtailed markets may be overcome by foresight or met with judgment—they are the ordinary contingencies of business. But fire may at any time result in practically irreparable loss if it is not held to narrow bounds. Under these circumstances says the Financial Post, investors in securities based upon the pulp industry are deeply concerned with safeguards against the menace of the flames.

It may well be repeated in this connection that an ounce of prevention is worth several ounces — at least of cure. Protection is prevention and insurance is one of the few cures. But the latter represents a high rate of expense and hardly covers the whole situation, for a forest reserve valuation may not cover the fact that there is practically no means of replacement and that an estimate to-day is not likely to cover the ultimate value of the timber at the time it would go into consumption owing to the steadily rising of prices.

The St. Maurice Valley in Quebec embraces one of the most valuable pulpwood tracts in the Dominion, concessions of one to two thousand square miles being held by Laurentide, Wyagamack, Quebec and St. Maurice Lumber, etc. It will be interesting to shareholders in these concerns to know that the whole district, embracing nearly 12,000 square miles, is covered by a co-operative fire-protective service which is perhaps the most efficient organisation of the kind on the continent.

An Important Service.

The St. Maurice Fire Protective Association offers an interesting feature of this sort in Canada, according to the Director of Forestry, R. H. Campbell, in a special report prepared for the Department of the Interior. He describes the organisation of the association as one of the most important advances in connection with forestry work in Canada during the last few years. Not only is it the only Canadian organisation of its kind in existence but it is considerably above the average of such associations in the efficiency and cheapness of its forest fire protective system.

The Companies Concerned.

Following is a list of the companies in the membership of the association referred to, together with statistics of areas and the assessment paid at $1.60 per square mile.

	Sq. Miles	Ass'ment
Quebec and St. Maurice Ind.	2,777	$4,444
St. Maurice Lumber	2,551	4,081
Laurentide	2,395	3,832
Gres Falls	1,053	1,648
Wayagamack P. & P.	1,135	1,816
Belgo-Canadian P. & P.	997	1,596
Union Bag and Paper	479	766

Wm. Baldwin, J. A. Rosseau, R. L. Turner, G. H. Dansereau, Reed & Co., Ellwood Wilson, Wm. Ritchie, E. M. MacLaren; Fawke, Tingling & Drummond and MacDonnel & O'Brien hold concessions from 19 to 97 square miles. The total is 11,937 square miles and the total assessment $19,098.

History of Movement

The St. Maurice Fire Protective Association was organized in the spring of 1912, along the lines of similar organisations operating in the United States. The lumbermen were in position of having to help themselves to secure efficiency protection, owing to laxity of the government regulations. Prior to this, in May 1908, the Laurentide company took the initiative in providing protection additional to that of the government. This service by twenty-seven rangers proved so successful that additional expenditures were warranted and the co-operation of the owners of other limits in the valley was made in 1909, but met with little favor, despite the strong advocacy of Superintendent Wilson, backed by the Laurentide Company.

However, a co-operative association was started consisting of owners of timber limits along the right of way of the Transcontinental railway. This was so successful that when a proposal was again made in 1912 to embrace the whole St. Maurice district it was accepted.

THE NORWEGIAN PAPER INDUSTRY SITUATION

The Department of Trade and Commerce says that it is very difficult to obtain a satisfactory view of the situation within the paper industry at present as the conditions are too changeable. The results of the work are indeed very discouraging.

At the present time there is paid for small coals just about three times the regular price, the freights are very high, and the timber is selling at such a price that professionals are of the opinion it would be better to temporarily close down the mills until better times appear. It is very hard to place orders on account of the difficult transport situation.

Some kinds of paper, however, have reached a high price. Among these may be mentioned grease-proof, for which 40 grammes of stock is paid £20-£21, 37-40 grammes £22, 34-36 grammes £23 and 22 grammes £24. All net f.o.b. steamer.

Rotation is in much demand, and it is almost impossible to obtain contracts for future delivery of this kind.

COLOR

Blue.—It is a well known fact that bluing is used in the laundry to whiten cloth by imparting a bluish tint and thus neutralizing the yellowish appearance which would result if no blue were used.

As blue and yellow, when mixed produce a green tint, spruce wood fibre which is yellow when colored with a pure blue, will give the paper a greenish appearance when same is compared with a white substance.

To offset this greenish tint a little red is added or better still, a blue can be used which is not a pure blue, but a red shade of blue called a violet shade. When a sheet thus colored is compared with a pure white substance, its appearance is nearer a white, than if pure blue was used, the greenish tint having become neutralized by the red.

If still more red is used the paper will have a pinkish or warm appearance when same is compared with a white substance.

White Paper.—It is impossible to produce a white paper from fibre which is not itself white, by using different colors. The paper may have the appearance of a white paper, but when compared with snow, the color will be "off" (pinkish, reddish, bluish, etc.).

Highly Colored Papers.—It is an easy matter to produce a paper of a decidedly strong color as red, yellow, green, etc., by matching same with strong samples. This is only a case of good judgment. When it comes to a white paper it is a different proposition.

Comparison.—In producing white paper, it is necessary to have some standard sample and to keep as near to this standard as possible. A standard color can be secured and by comparison, color of the same strength would be purchased. As to color—whiteness or brightness is the first thing that appears to the eye. Being the first, it is the most important.

Selection of Colors.—In selecting colors for use in whitening paper, one must take into consideration the nature of the color itself. The number of colors or colored substances is without limit, especially those embraced under the aniline or coal tar colors. In general colors are divided in two classes, pigments and dyes.

Pigment Colors.—Pigment colors are those which are not soluble, but which produce a colored effect by mixture with the paper pulp or fibre. They are of the same class as clay. Clay is a white pigment. When stirred with water it does not dissolve like sugar or salt, but it disintegrates into a white powder, which floats about in the water.. If the clay is white, then the mixture is like whitewash. If such a substance like clay and water is mixed with pulp it is held to a large extent by the fibre, being mechanically mixed with the fibre. Such white, fine insoluble mixtures which get in the pores of paper are called "fillers." They might just as well be called white pigments. If instead of a white clay, a yellow clay called ochre were used it would impart a yellow tint. Ochre is a pigment, is insoluble and mixes well with paper fibre. A red clay, powdered-oxide of iron, venetian red, are similar pigments, and impart a red color to the paper.

Aniline Color or Dyes.—By far, colors are mostly of the aniline dye class. Unlike the pigments, the dye colors the fibre itself and not by mixing with it. Pigments can be washed off, but in the case of dyes, the paper is dyed permanently. The various aniline colors differ in their capacity to dye fibre of different material. A color which might silk or wool, might not be suitable for dyeing wood or cotton at all.

Affinity of Colors for Fibres.—A color which leaves the water in which it is dissolved and goes to the fibre placed in the solution, is said to have an affinity for that fibre. We have certain colors which have a strong affinity for certain fibres and little or no affinity for others. There are various colors of the same shade which have some affinity for some fibres and none for others. Auramine has an affinity for wood fibre and will dye same to a deep canary, which will not wash out, while napthol yellow will dye the same color and will nearly all wash out. Therefore, in selecting colors it is **necessary** to know their behaviour towards wood fibres.

Mordanting or Fixing Colors.—Some colors will not dye fibres direct, but can be made to dye same with certain chemicals as tin, antimony, etc.

Acid and Basic Colors.—There are other colors which require acid or alum to develop or brighten them, such colors are called acid colors. Neutral or basic colors give their strongest or brightest effect with no alum or acid or require but little. If size is used it is, of course, necessary to use enough alum to precipitate the size. It is of importance therefore to select only the most efficient and economical colors to meet the conditions required. It is a bad practice to make use of a color which requires a large amount of alum or other chemicals to make it produce good results.

Incompatible Colors.—Owing to the different nature of colors, some being basic or neutral and some being acid, it is not possible to make a mixture of the two without having one of them act chemically on the other in a harmful way. For example, an acid color may be completely dissolved in water and a basic color also dissolved. But when one of these solutions is added to the other a combination results which causes a portion of one or the other or both, to become insoluble and to separate in the form an insoluble powder, which no longer has any dyeing power, acting simply as a pigment. This, of course, lowers the value of both the colors, and although a certain coloring effect is produced, it is not the full effect that should be obtained. It is much better to select for such a purpose colors that are both acid or basic, which do not precipitate each other. If incompatible colors are made use of, they should be furnished last, and one at a time separately dissolved, so that one may not precipitate the other before all the stock is furnished.

Color Solutions.—In general, all color should be dissolved in the same proportion as for example 5 pounds to 50 gallons. In special cases, where a very strong color is required and the color is quite soluble, 10 pounds or even 50 can be dissolved in 50 gallons of water. Such cases are, however, rare. In cases where the color is not readily soluble, or where it separates out of the solution, when it gets cold it is best to dissolve a smaller quantity. Fuschine is an example of such a color. Color should be thoroughly stirred in the tank of hot water before giving to the engine. Never furnish color dry, no matter how soluble it may be or how much or how little is to be used. It should

be dissolved, or the color spots will show in the paper, and the paper color will not be uniform.

Dissolving. The water should be heated nearly to the boiling point, and the color then added, stirring until a complete solution takes place. Some solutions retain their strength for a long time, while others lose it. In view of this fact only enough for a few days should be made. When one color is to be used for a long time, it is well to have two tanks. One tank is used at a time, and when this is empty the other has been stirring for 24 hours. Agitators cost but little, and should be used in every mill. In connection with this it may be well to state that the two tanks should not be connected with water or steam, because valves become leaky in time, and water from the pipes condenses, causing the color to become weaker. Connections can be made if the valves have "drips." It is safer however, to fill the tanks with a hose and heat the water with steam pipes with elbows made up loosely so that after the water is heated, you can swing the elbows out of the tank.

Measuring—For measuring, have ½, ⅛ and 1-16 cups. A cup of color means out of a 5 lbs. to 50 gall. solution. At first color should be furnished when the stock is thin to allow the same to be well distributed. When the beater is full the stock moves slowly. When a little size is furnished, it is customary to measure the size with a dipper and to put in the same pail with the color. This should never be done as the alkali acts upon the color and makes it weak. For this reason, if for no other, size should be thinned with hot water and given to the beater by itself, it then quickly mixes with the stock and has no harmful effect upon the color. Size like color, should be furnished before the stock is thin, it makes no difference which is furnished first if one is well distributed before the other is added.

Alum.—Many claim they have colored and sized paper with good results, by dumping in thick size and dry alum altogether the first thing and putting in dry color the last thing. In certain cases this may have been true, but experience has shown us that more satisfactory results as to economy, uniformity and reliability are obtained by exercising better judgment in this case. While one color may give as good results when furnished dry, another may not and while size spots may result in spite of neglect of the proper way at other times the same results are not obtained. Trouble and expense would have been avoided if the correct practice was adhered to.

Many cases of bad paper are traceable to wrong practices in furnishing the engines and show the wisdom of rational observation and experience.

Selection of Colors.—Oftentimes the dearest color is the best and proves to be the cheapest in the end. No lack of variety should be made in selecting proper colors. Standard colors should be selected that will give the best coloring at the least cost. Not only the cost of the color but the cost of the alum, size, etc. should be taken into consideration. For example: At one mill a red color that was cheap required 50 lb. of alum to develop it. Another mill uses a color which is more expensive, but requires no other chemical to give the desired shade. New colors are constantly being made by the aniline works, and one must keep posted as to the best and most economical.

Testing Colors.—To decide as to the value of two colors is a simple test, providing the tester has good eyesight. All that is necessary to ascertain is which gives the greatest coloring effect at the least cost. It is not necessary to know how the color is made or what chemicals are in it. All that is required is to know if it will give a better effect than another color or whether it requires more alum or chemicals to brighten it.

Testing on a large and small scale.—As a matter of fact, two colors can be tested at a mill more satisfactorily than in a laboratory, if it were not for the fact that the contents of the beater would be lost or made valueless, by imparting the stock the wrong shade.

Colors are tested in a laboratory by making up a given solution from a correct weighed quantity of dry color, using pure hot water and seeing the complete results. Some stock is prepared by mixing up the proper proportion of ground wood and sulphite. Some of the stock is thinned with water so that it takes two gallons of the mixture to make 1 oz. of dry fibre. The same amount of this measured stock is taken for each color that is to be tested. These portions are poured in white bowls and the same quantity of color solution is added to each bowl. Alum is added, in the case of colors requiring same. After stirring occasionally and left to stand half an hour so that the color goes into the fibre as completely as possible the stock is poured on the wire cloth, pressed between clean cloths and blotting paper and the colors compared. It can be observed which is the strongest and which the weakest, and the different shades, tints, etc., can be easily picked out. In order to tell exactly how much stronger or weaker one color is, it is necessary to use various proportions of the same color solutions, always using the same quantity of stock. Should 5 measures of one kind give the same color as 10 measures of another, then one is twice as strong as the other. If the color is weaker than the standard, it can be found if it is 5 per cent, 10 per cent, 15 per cent or 20 per cent weaker. Weaker colors should be avoided.

Each lot of color should be sampled at a mill. Considerable expense and trouble can be saved by the discovery of a weak shipment.

Tests are sometimes made as regards the affinity of a color, by observing the quantity of color left in the water running from the stock. If all the color is taken up by the fibre and the water runs away colorless or nearly so, the color has a strong affinity.

Tests for "fastness" are easily made. Stick two papers of one shade and strength of color by putting same in a book, leaving a part out. From to time they may be taken out and compared and examined. Some colors fade rapidly and are called fugitive colors. As a rule basic colors are not as "fast" as the acid ones, but where fastness is of little importance, the basic colors can be used to better advantage on account of their superior strength and brightness as well as the fact that they require but little alum to brighten them.

Mixed Shades.—In making a colored paper a brighter effect is produced by using a "straight color" rather than by the mixture of two colors. Pure colors can be easily tested by dipping a blotter in alcohol and taking out and blowing some color on same.

Poor results with violet colors.—A violet color gives a better effect than a red shade of blue, but a very undesirable characteristic of violet, is that in artificial light, it looks very poor indeed. A paper whitened by means of violet looks whiter in the day but at night it has a poor appearance being of a brownish tint.

Effect of Oxalic Acid.—When the pulp is old and of poor color, oxalic acid, brightens or bleaches it when used in quantities of about 10 pounds to a 1000 pound engine. This develops blue color better than alum, but it is very injurious to the machine wire and is expensive. Other chemicals like vitriol and acetic acid are sometimes used to develop certain colors, but as a rule they are not as efficient and are injurious upon the machine clothing. They should be used with caution. In the case of certain colors like eosine and scarlet, sugar of lead, etc., renders them less liable to wash out, but it is best to look for a color that will not wash out. This can be done by buying colors which have affinity.

The Effect of Drying of Water in the Cylinders

That opportunity exists for improvements, and economies in the process of drying the paper web on rotary cylinders, is well known. Many paper manufacturers have made extensive and expensive experiments in this direction during the past four or five years. Just now, general interest in this subject is at what might be termed "fever heat" on the part of paper manufacture and paper machine builders and engineers as well. well.

Hindrances to Perfection in Drying.

The principal impediments to perfection in the drying process seems to be, broadly speaking: First, insufficient drying capacity; second, a seemingly high rate of steam consumption; third, lack of uniformity in moisture retention; fourth, impossibility of controlling or regulating the drying temperature.

Considering these hindances in the order mentioned, although not necessarily in the order of their importance, most of the paper machines in this country today are being run at speeds from 10 per cent to 50 per cent greater than were contemplated at the time of their installation. It has been found possible to speed them up at the wet end or to rebuilt the wet end quite easily, so as to get the proper formation, etc., with the result that the drying end has been crowded at a sacrifice of the quality of the product. And in the majority of cases, the speed of the machine and the quantity of product is kept down by the lack of drying capacity. Under present business conditions it seems absolutely necessary to secure the maximum tonnage from every paper machine, so as to reduce the conversion costs per ton of product to a minimum.

Considering the second point, the fuel item is one of the big expenses in paper manufacture, and it is the constant aim of the manager and superintendent to reduce the fuel consumption. When it is considered that the process of drying requires a boiler horsepower steam consumption as great as, and in many cases in excess of, that for power for driving the machine, naturally an effort to effect economy in this direction is well worth while.

The third and fourth points can well be considered together, for one is the effect and the other the cause, so to speak. Their results are cockling and shrinking, wet edges and streaks, the paper coming to the calenders, sometimes too wet and sometimes too dry, the lack of a proper and uniform finish, and also a wide variation in tensile and bursting strength of the finished product.

It is unnecessary to go further into detail regarding

In Paper Trade Journal.

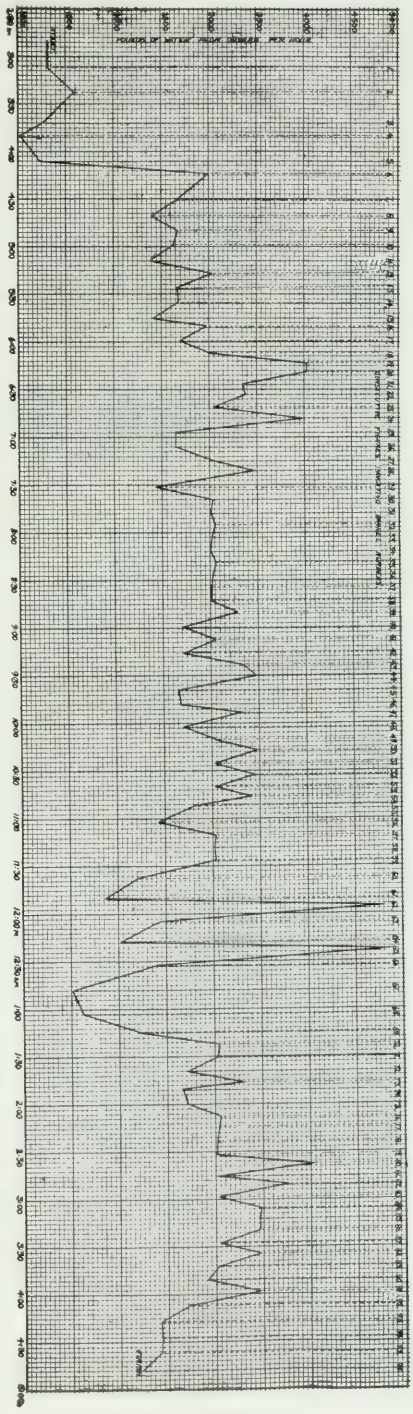

Chart Illustrating Fluctuating Rate of Discharge of Water of Condensation from Paper Machine Dryers Equipped with Siphons.—

Explanatory Note: The figures from 1 to 96 indicate the consecutive numbers of barrels are placed on the chart at the point of time at which the barrels were filled, as shown by the dotted lines. The Horizontal chart lines indicate the rate of flow of water from the dryers in pounds per hour, while the Vertical chart lines indicate the time.

the lack of perfection in the drying process along these lines, because every paper maker is only too familiar with them all. The point that is interesting, is the cause or source of these drying troubles.

For many years it has been recognized that the water of condensation accumulating in the dryers, oil, where exhaust steam is used for drying, and the presence of air in the dryers have exercised a powerful and baneful effect on the drying. The exact effect of the water or the quantity of water remaining in the dryers, or the rate of discharge of water from the dryers with various systems of drainage, has been largely a sealed book, and to a certain extent, still is, for none of us possess an X-ray eye, and the dryer heads being non-opaque, it is an impossibility to see what is going on inside the dryers. And the conditions of laboratory experiments, are far from being the same as those existing under practical operating conditions.

A Test Reveals Effect of Water on Drying.

However some progressive paper manufacturers have recently been conducting tests along these lines, and it has been the good fortune of the present writer to have co-operated in or to have been present at some of these tests, which seem to throw considerable light on this interesting subject.

The curve illustrating this article was plotted in chart form from a condensation test of a paper machine equipped with the usual type of syphons. The test was conducted in the following manner:

All water discharged by the syphons, instead of flowing to the hot well, was conducted to a condenser consisting of a number of lengths of pipe submerged in a tank of cold water. From this condenser the water emptied into barrels. The temperature of the water was noted, each barrel carefully weighed and temperature corrections made in weight. Also the exact time required for filling each barrel was observed.

The net weight of each barrel of water was divided by the number of minutes required to fill that barrel, which gave the average flow of water in pounds per minute. Multiplying this figure by sixty gave the average flow of water to each barrel in pounds per hour. And from this data, the curve was charted.

Rate of Water Discharge from Dryers.

Referring to the chart it will be seen that the test was started at 2.50 p. m. and that the rate of discharge of the first barrel which was filled at 3.08 p. m. was 1,320 lbs. The second barrel as indicated by the second point on the chart was filled at 3.23 p. m., and its rate of discharge was 1,590 pounds per hour. The third barrel was filled at 3.42 p. m. and its rate of discharge was 1,254 pounds per hour. The fourth barrel was filled at 3.50 p. m. and its rate of discharge was only 1,020 pounds per hour. The rate of discharge of the fifth barrel was 1,230 pounds per hour.

Up to this point the water had not been flowing very rapidly from the dryers through the siphons, therefore the dryers had temporarily become pretty well filled with water, the result being that their temperature had lowered to such an extent that the paper had a tendency to run wet. To correct this tendency a slightly higher steam pressure was put on the dryers which forced the water through the siphons so that the discharge rate of the water which filled the next barrel, the sixth, was 3,000 pounds per hour and it was filled in only eight minutes, whereas the previous barrel No. 5, had required sixteen minutes.

From this time, 4.14 p. m., on the chart, until 6.07 p. m., at which time the eighteenth barrel of water had been filled, the rate of water discharge fluctuated between 2,400 pounds and 3,000 pounds per hour. Then a sudden increase in the discharge rate occured. The nineteenth barrel, filled at 6.13 p. m., was at the rate of 4,038 pounds per hour, and the twentieth barrel was at the same rate. There was then a fluctuation between 3,000 and 4,000 pounds until the twenty-fifth, which was filled at 6.57 p. m., at the rate of only 2,650 pounds per hour.

A Remarkable Fluctuation in the Water Discharge

It is interesting to note that from 7.39 p. m., until 8.43 p. m., there was a very even and uniform discharge of water, in fact during this period of little over an hour, occurred the only practically even discharge rate of water from the dryers during the test period of fourteen hours. At 11.50 p. m. the water commenced to fluctuate in its rate of discharge to quite a remarkable extent, as will be noted on the chart. One barrel filled at the rate of 1,860 pounds per hour, the very next one being 2,430 pounds, and then one at 2,028 pounds per hour; and the next one at 4,084 pounds, to be immediately followed by one at the rate of 2,424 pounds, with a decline in the rate of the next barrel to 1,512 pounds per hour.

The Unevenness in Drying Now Explained.

A study of this chart makes it comparatively simple to understand the unevenness of the drying condition of this machine, and the difficulties of the back tender to so regulate his steam as to get his paper drying even, because the fluctuation in temperature of the dryers necessarily will follow the curve of water discharge. It will be evident also that these fluctuations in drying temperatures will cause an irregular moisture retention in the sheet. With the sheet over-dried, the paper coming from the calenders is rough and has but little character; when it is under dried, it blackens and has a hard glossy surface, whereas, with the proper moisture retention, the paper has the appearance of being very much better closed up.

It might be remarked at this time that this test was run on the same grade and weight of paper throughout. Consequently it seems difficult to attribute the cause of the fluctuation and wide variation in the rate of discharge of the water to any cause other than the spasmodic, irregular and unreliable action of the siphons in emptying the dryers of the condensate.

It is a recognized fact that water if allowed to accumulate in the dryers will have a tendency to cool the dryers and will also absorb a considerable percentage of the heat units in the steam.

The chart shows that the siphons permitted water to remain in the dryers, and that the quantity of water in the dryers varied from time to time. Consequently, this imperfect and spasmodic removal of water would have the effect of reducing the drying filling with water to a considerable extent, would not at all times be doing its full and proportionate share of the drying.

Also it is apparent that a large percentage of the steam admitted to the dryers, was condensed by coming in contact with the water, and was not utilized for drying the sheet passing over the dryers. In this way fuel was being consumed to generate steam which was entirely wasted in the dryers.

The Test Made Under Average Working Conditions.

It might be remarked in conclusion that while this machine was not a brand new one, yet it was in fair operating condition; in fact its condition was as good, if not better, than the average paper machine in this country to-day, and the siphons were all in good shape and as close to the bottoms of the dryers as possible.

UNITED STATES NOTES

The Northern Paper Mills at Green Bay, Wis., now have both of their machines installed and in operation at their mill, which has increased the output of the big tissue mills to 80,000 pounds per day.

* * *

The new power plant of the Union Bag & Paper Company, at Hudson, Falls, N. Y., will be open and ready for operation this week. This plant will increase the utility of the Union Bag Mills in this section, for they will be able to run regardless of water conditions in the vicinity.

* * *

The Pridham Company, of Sumner, Wash., has changed hands Mr. Pridham selling his interest in the paper mill to the Northern Board and Paper Mills Co. of Los Angeles. Mr. Pridham will put up a building 86 x 200 ft east of the paper mill, to be used as a box and container factory. This will probably enable the mills to double their output.

* * *

The officials of the Fibre Corporation at Lockport, Conn., whose plant was recently destroyed by fire, are rushing the work of getting the erection of their new plant under-way. One building has already been completed, having been erected by the company itself. Contracts will be let in early in July for five additional buildings.

* * *

The hearing of the claim of the Battle Island Paper Company, of Fulton, N. Y., case against the State of New York for damages was resumed at Syracuse on July 7.

* * *

The work of razing the old hydraulic power plant of the Oswego Falls Pulp and Paper Company, Fulton, is nearly completed. Most of the machinery has been removed, and dynamite will probably be used to blow up the old foundations. A large amount of excavating will have to be done in what will be the tail-race of the new power plant, and a bridge has been built across the barge canal, and tracks laid by the construction company. The concrete foundations for the new pulp mill have been completed and the laying of brick was begun to-day.

* * *

Plans for the new paper mill to be built by John King, who recently resigned as vice-president and superintendent of the King Paper Company, have nearly been completed, and it is understood that contractors will soon be asked to submit bids for the work. While no decision has been reached, it is almost certain that the structure will be erected east of the Hawthorne Paper Company's plant in the Kalamazoo River.

* * *

The Bryant Paper Company of Kalamazoo, Mich. is erecting a large concrete retaining wall for its coal yard. The wall shuts off the view of the coal from the street and at the same time makes it more convenient to be handled.

It has been learned that a concern located at Chester, Conn. is now engaged in the manufacture of aniline dyes. Picric acid is one of the aniline dyes that the concern is making and, like all coal products, it is explosive. The concern has no name as yet, and it is referred to as 'the dye works' in Chester. The business of the firm is done under the name of John T. Hettrick, fiscal agents, 1656 Broadway, New York City.

* * *

The work of rebuilding the Gould paper mill B, at Kosterville, N. Y. which was destroyed by fire several weeks ago, has begun. New sawing machines, barkers, presses and screens will have to be provided to replace those ruined in the fire. The building material is expected very soon and it is the hope of the company that the mill will be running full time in the near future. The steel and concrete flume, with a capacity of 1,400 horse power, was undamaged and will be used in the new plant.

* * *

Arrangements are being completed for the erection of an addition to the office of Crane & Company in Craneville, New Dalton, Mass. The addition will be built of brick with stone trimmings and will be 25 feet square. John Dwyer, the contractor who is in charge of the work will also build an addition 25 x 30 feet on the east side of the office building at Z. and W. M. Crane's Bay mill this summer.

* * *

The United States Printing and Lithographing Company, of Norwood, O. has decided to increase its capital stock from $3,500,000 to $10,000,000 divided into 100,000 shares of $100 each, of which $3,800,000 shall be first preferred shares, $2,000,000 second preferred shares and $4,000,000 common shares, $2,000,000 second preferred shares and $4 200,000 common shares and to create voting powers rights, benefits, restrictions and limitations thereon.

CHINESE MERCHANTS IMPRESSED WITH CANADIAN PULP FACTORY.

Buffalo N.Y.—Members of the Honorary Commercial Commission of the Republic of China in their tour of investigation of the commercial, industrial and educational interests on this side of the Pacific were entertained here June 16th and 17th by the Buffalo Chamber of Commerce. A feature of their visit was a trip to the Beaver Board Plant at Buffalo and their mammoth wood fibre mill at Thorold, Ontario. The commission was much interested in their visit and impressed with the adaptability of Beaver Board for interior construction in the Orient.

The trip to Thorold was made by automobile stopping of course to see the wonderful sights at Niagara Falls. After visiting some of the other large manufacturing plants a farewell banquet was given at the Buffalo Country Club at which time the Chinese speakers strongly emphasized the wonderful possibilities of trade communication between this Continent and China

PULP AND PAPER NEWS

Patrick McSherry, who was widely known through his connection with government surveying and lumbering, passed away at his home in Toronto last week, aged 82 years. He, at one time, owned extensive timber limits around Stayner and later in the Rainy River district. He is survived by a widow.

At a meeting of manufacturers held in Toronto last week at which a number of pulp and paper men were present, the matter of Canada's export trade was considered and steps taken to further the Canadian Export Association. G. M. Murray, secretary of the Canadian Manufacturers' Association, presided and addresses were given by Messrs. Armstrong and Younge, who pointed out that the first object of the Association would be the development of trade within the Empire, and the second object to work up trade with the allied countries during the period of reconstruction. The Association will open offices in London, Moscow, New Zealand and Australia. At these points the work of the representatives will begin where that of the Government Trade Commissioners leaves off. The latter give the manufacturers information, while the Canadian Export Association will find and give them customers.

R. A. Lyon who is a director of the Toronto Paper Mfg. Co., has just been elected a member of the Toronto Stock Exchange, his election being rendered necessary by the enlistment for active service of Mr. Plummer, his partner, who has been the floor member of the firm hitherto.

The Foley-Rieger Pulp and Paper Company of Thorold, Ont., report business as good and they have appointed Mr. Gottesman and Son, of New York, as their agents in the United States.

Among the paper representatives from Toronto who took an active part in the Ontario Lawn Bowling Tournament at Niagara-on-the-Lake during the past week were T. H. McDermott, manager of the Toronto branch of the Lincoln Paper Mills Co., who was skip for a rink of the Kew Beach club, A. M. Huestis of the Royal Canadian Yacht Club and F. L. Ratclif, who was vice-skip in a Granite club rink who captured second prize in the consolation series.

The many friends in the paper trade of T. A. Weldon of Thorold, Ont., vice-president of the Provincial Paper Mills Co., will sympathize with him in the death of his only son, Dr. Thomas Cecil Weldon, who passed away on July 3 after a lingering illness. He was in his thirty-fourth year and a graduate in medicine of Toronto University having practised his profession in Toronto for a short time. When his father removed to Thorold to manage the Montrose Paper Mills, his son took a position on the office staff in the hope that the change would benefit his health. About two years ago he began to fail rapidly and his removal to Gravenhurst [illegible] did not bring the desired improvement. The remains were interred in Mount Pleasant Cemetery, Toronto. His father, mother and one sister survive.

The Methodist Book and Publishing House have completed the removal of their plant and offices to their handsome new home at the corner of Queen west and John Streets, Toronto, which is one of the finest publishing structures on the continent.

"No business of any description transacted with the Germans now or ever" is seen in red letters on a sign prominently displayed in the office of Ritchie and Ramsay, Limited, Toronto., who have always been warm advocates of the Made-in-Canada idea and were the first to use these words on their products in 1896, when their brand of Red Seal coated paper was originally introduced.

Owing to the death of George R. Copping, of Toronto, who was a victim of the Lusitania disaster, several changes have been made on the boards of the Barber Paper and Coating Mills, of which the deceased was president, and also on the Board of the Provincial Paper Mills. At a recent meeting of the directors held in Thorold I. H. Weldon was made president of the Barber Paper and Coating Mills and the place of the late Mr. Copping on the Board of the Provincial Paper Mills Co., was filled by Alex. Fasken, K. C., who for several years has been solicitor of the company.

At a meeting of all the lumbermen and pulp wood operators on the North Shore, held at Sudbury, a resolution was unanimously passed, petitioning the License Commissioners of Ontario to cancel all shop licenses in the districts affected by lumbering and pulp wood operations. There are some fifteen thousand men employed in the North Shore district.

Among those who met death in the Queenston electric railway disaster last week, was Sydney W. Grant, advertising manager of the Westminster Publishing Company, Toronto, which position he had filled for seven years. He was fifty years old and leaves a widow and two sons.

The Morang Educational Co. Limited of Toronto, applied for an injunction recently in Toronto to restrain the T. Eaton Co., from sending 92,000 school readers to the province of Nova Scotia. It appears that the latter company have entered into a four year contract for supplying the Nova Scotia schools and had been instructed to ship the initial lot. The Morang Co. contended that its ten year authorization did not expire until July 1st and hence the application to restrain the T. Eaton Co. from publishing or selling Nova Scotia school books. The injunction was refused.

John Hewitt, Jr., who has been the representative in Toronto for some time for Price Bros. and Co., left this week for Quebec where he takes an important position on the head office staff.

F. J. Campbell, general manager of the Canada Paper Co., accompanied by his wife and child, is spending a few weeks at Muskoka Lakes.

Harold Harcourt, son of the late E. H. Harcourt, head of the lithographing company, Toronto, is recovering from an attack of appendicitis.

Sir Rodolphie Forget, M. P., of Montreal, has been appointed by the Federal Government as one of the members of the Hospital Commission, who will deal with the situation that will arise by the return to Canada of the sick and wounded from the front during the progress of the war.

Charles H. Porter of Toronto, who was a fire ranger under the Department of Lands, Forests and Mines met death last week by falling from his canoe near West Shining Tree Lake where he was visiting a party of prospectors. On examination no water was found in his craft and it is supposed that a weak heart caused the accident. He was twenty-five years old and the remains were brought to Toronto for internment.

Owing to the contractors on the Welland ship canal at Allanburg dumping the dredged earth too far out in the channel from the basin, passing ships stirred up all the debris. The water in the old canal became so dirty and muddy that all the pulp and paper mills at Thorold, Merritton and St. Catharines who use the water in the beating and washing engines and also for filtering purposes had to shut down for three days last week until the trouble was attended to by the canal authorities.

With the object of making flax growing and manufacturing a permanent industry in Canada, and the securing of Government assistance to this end, the Canadian Flax Growers' Association was organized at Hensall, Ont., at an enthusiastic meeting of flax men from all over Ontario. It was pointed out that there was no reason why the flax-growing industry in the province should not have more of the prosperity enjoyed a few years ago when fifty busy flax mills made Ontario the leading flax region on the continent. Howard Fraleigh, of Forest, was elected president of the new Association.

E. L. Crooker, who is the representative of the Laurentide Co., in New York, spent a few days in Toronto this week among his old friends in the paper trade.

The British American Wax Paper Co. Ltd. move into their new quarters at the Wrigley Building, Carlaw Avenue, Toronto, on July 1st.

Their installation in the new factory will be of the complete kind of printing, waxing, slitting, and cutting devices, and the floor area will be approximately 30,000 square feet.

The Inland Pulp & Paper Company of Thorold and K. Eshelman Bros. recently joined their claims against the government in connection with lands taken for the Welland ship canal. They asked $472,000. The canal valuator offered $18,300. Judge Cassels has just handed down his award granting them the original figure offered.

The Inland Company asked $300,000 for an acre of land taken. They were awarded $1,300, of which $1,000 represents reparation for changing a grade. Eshelman Bros. asked $172,000 for about fourteen acres. The award given them is $17,000.

A report from Peterboro, Ont., states that Mr. C. Brisbois has left with a gang of men for Monteith, New Ontario, where he will erect a sawmill and pulp mill for a company in which Mr. John Thompson, of Peterboro, is interested.

Louis F. Houpt has been appointed general sales agent for the output of the Jonquieres mill products of Price Bros. and Co. The offices of the company in Toronto have been removed from the Traders Bank building to 419 King street west. Mr. Houpt will be assisted by E. A. Crippen in the selling end. They will look after all the sales of various kinds of board and papers turned out at Jonquieres, including all specialties in that line, and it is understood that Price Bros. and Co. will install a bleaching plant in connection with high grade bleached and water marked bond papers. John Hewitt, who has been the representative of Price Bros. in Toronto, will be transferred to the head office of the company in Quebec.

The Acme Paper Box Co., Limited, has been granted a charter with a share capital of $40,000 and head quarters in Winnipeg, where, it is understood, that they will establish a plant.

A reorganization has taken place in the firm of Newsome and Gilbert, law and commercial stationers, Toronto, and the business will be carried on by Wallis Dunn and George W. Woodland, who have taken over the assets and good will. These gentlemen have been connected with the old firm for several years and have many friends in the trade.

Hon. G. H. Ferguson, Minister of Lands, Forests and Mines for the province of Ontario, reports a substantial increase in the collection by his department for the seven months ending May 31st last. In 1914 the collections for that period were $882,565.66 while this year they have amounted to $1,002,565, an increase of seven per cent.

Notice has been issued under the Ontario Companies Act Supplementary Letters Patent reducing the capital stock of the American Sales Book Co., Limited, Toronto, from the sum of ten million dollars to the sum of $3,687,960, divided into 37,733 preference shares of one hundred dollars each being the preference shares already issued and 3,733 common shares of twenty dollars each, and that such reduction be effected by cancelling 19,267 unissued preference shares of one hundred dollars each, being all the unissued preference shares, and by cancelling 19,267 unissued shares of one hundred dollars each, being all the unissued common shares and by reducing the nominal amount of 37,733 issued common shares, being all the issued common shares, from one hundred to twenty dollars each, providing that every holder of preference shares shall have five votes for every preference share and every holder of common shares shall have one vote for every common share.

The regular quarterly dividend of two per cent on the capital stock of the Laurentide Co., Montreal, has been declared.

The death took place in Montreal last week, of James Jephcott at the age of forty six years. He was at one time connected with the Toronto Lithographing Co., but for the last twenty years had been identified with the Montreal Lithographing Co, eleven of which he was President of the concern. He leaves a wife and two sons. He was a member of the Montreal Board of Trade, the Engineers Club and other societies.

J. B. Beveridge, General Manager of the Dryden Timber and Power Company, Dryden, Ont., has been elected by acclamation to the Dryden Town Council.

A pulp paper mill is to be constructed at Selkirk, Man. The cost is estimated at $150,000. The construction of the plant is to be pushed ahead as rapidly as possible. J. S. Hughes, Mill Village, N.S., is interested in the undertaking.

The Canadian Wallboard Company has been incorporated under Dominion charter to manufacture and deal in pulp and paper products.

The Abitibi Pulp & Paper Co. at Iroquois Falls have finish 14 cottages and have started work on 25 more, costing about $1,200 each. They will also erect during the summer 75 more cottages to cost about $800 each. Every house is electric lighted and have bath rooms and water in them.

The Brompton Pulp & Paper Company's drive of 45,000,000 feet of logs and pulpwood went down the St. Frances River past East Angus, P.Q., on June 12th, with a crew of 100 men as drivers.

Envelope manufacturers are fairly busy at the present time and the majority are running to about two thirds capacity. The recent raise in postage rates occasioned by the war tax has not made any material difference so far in the demand for all kinds of envelopes. The only difficulty that firms are experiencing is the matter of colors, which they claim is a fad. They are advising the customers to eliminate colored lines owing to the present acute situation in dyes. One leading company said this week that they had not raised the price on colored envelopes, but had practically ceased making them altogether, and were confining their output to white and blue, there being no scarcity of the latter color. It was stated that many business houses were conforming to the new policy of the manufacturers.

The F. N. Burt Co. of Toronto, makers of paper boxes, counter check books, etc, have been incorporated in the state of Illinois where they have been licensed to do business. Without a license they had no legal status in the state.

A contract has been let to Reid McManus, of Memramcook, N.B., for the construction of a spur line of railway connecting the main line of the Intercolonial with the new pulp mill of the Bathurst Lumber Company, Bathurst, N.B. The contract price is $61,000.

Ottawa Notes

Ottawa, Ont., July 10th. The presence of the gypsy moth in shipments of various forest products including pulpwood, from the United States, has led to the passing of an order in council as a result of which all "forest plant products, including logs, tan bark, posts, poles, ties, cordwood and lumber originating from any one of the States of Maine, Massachussetts, New Hampshire, Connecticut and Rhode Island, shall not be admitted into Canada unless accompanied by a certificate showing that they have been inspected by the United States Department of Agriculture and found [illegible] the gypsy moth."

[illegible] and [illegible] companies in this city have been [illegible] by a number of fires recently in spite of the [illegible] it is believed that they are incendiary [illegible]. The E. B. Eddy Company had a [illegible] work by the Hull fire [illegible] nting [illegible] becoming more serious. Last week the Gilmour and Hughson Company had a $[illegible] blaze which, if the very high wind which prevailed had been blowing the other way, would have endangered the safety of Hull and of other lumber and paper plants therein. The Hull police have been trying to locate the author of these mysterious fires.

Employes in the various pulp and paper mills in Ottawa and Hull have been lending financial aid of a substantial character to the strikes which have been declared in the Remington and St. Regis mills. Meetings of the locals of the various unions were recently held at which it was decided to support the strikers. At the same time considerable criticism was expressed because strikes had not also been declared in other nearby mills which, it was alleged, were furnishing pulp to the St. Regis and Remington mills and it was proposed to send a delegate from Ottawa to see that a boycott of this kind was enforced against the two mills complained of.

The placing of prize vessels captured by the British navy, in the forest products trade between Canada and Britain was announced by Sir Richard McBride, premier of British Columbia, when in this city en route to his home after a trip to England. Sir Richard while in the Old Country took up with the British Board of Trade the matter of scarcity of tonnage to carry British Columbia lumber, pulp and paper to foreign markets. As a result, he stated, he had been informed that prize vessels would be placed in this service. This will greatly relieve the congestion in cargoes of lumber, pulp and paper at Montreal and other points.

Although half of the 50 per cent surtax which was placed by the Canadian Fire Underwriters' Association has been removed from all other business properties in Ottawa, the whole 50 per cent has been allowed to remain on lumber and paper plants and their yards. The city was a week ago notified of the removal of 25 per cent of the surtax on all properties other than those mentioned, no reason being given for the retention of the full amount on the latter but the statement being made that in the near future they would be given a special rate. The reason for the partial removal of the surtax has been the improvement in the city's fire fighting facilities. On the completion of the new waterworks scheme known as the overland pipe project next spring it is expected that insurance rates will return to normal again on all classes of properties.

Five lumberjacks employed by the W. C. Edwards Company of this city were drowned last week in trying to shoot the rapids on the Lepine river. Their boat capsizing, they were sucked down in the strong current. Their names were G. Gauthier, A. Gauthier and E. Dontigny of Maniwaki, Que., A. Lafreniere of Whitefish Lake and A. Martel of Montcerf.

Judgment is expected next month in Eastern Freight Rates case which ended before the Railway Commission a week ago. It has now been in progress for four months. Although the case for the Canadian pulp and paper men was completed some time ago representatives of the J. R. Booth and E. B. Eddy paper firms participated in a delegation of lumbermen from the Ottawa Valley which made a final appeal for the reduction of forest products rates before the case was concluded last week. Mr. J. R. Booth and Senator W. C. Edwards acted as spokesmen for the delegation, Mr. Booth stating that he had been in business for the past sixty years and he had never seen a time when it was less advisable to increase railway rates than the present.

The Markets

CANADIAN MARKETS

Market conditions are rather listless during the summer months and requisitions for news print have slacked off owing to the decline in advertising in July and August. It is expected that the demand will be renewed to a great extent as soon as fall publicity opens up. The prospects are very good in view of the promising harvest in the west and the better feeling that prevails generally in many centres. The output of news print has been increased by some seventy tons from the Abitibi mills during the past week and, before many weeks are over, this production will be more than doubled. It is pleasing to record that the new mill has placed its output ahead for some time without disturbing market conditions. Too often when a mill starts operations it is the custom to shatter prices in order to secure a foothold.

In the book and writing line orders are fair and there is not likely to be much new business develop until the vacation is over. A leading member of the trade states that in going over the orders of his plant for the past year, he found that the decrease, owing to the war, was not as great as he expected and that production had come up to that of the preceding year within ten per cent. Colored papers are being less and less called for owing to the recent raise in price and the uncertainty of the dye supply. Tints are growing in favor.

One cause of the fairly satisfactory showing in all kinds of paper, outside of news print which is regarded more or less staple and not influenced by industrial conditions the same as the others, is that imports have fallen off a great deal. During the last fiscal year they amounted to $5,764,379 as compared with $8,043,368 the previous year and Canadian plants are making up the difference in kraft, art papers, glassine, greaseproof, calendered and other brands. Coating plants are running more fully than they have for some time past and the outlook is good. The wrapping paper situation is seasonably quiet and other lines show no change, except that owing to the color situation, there has been an advance of about half a cent per pound on cover papers and bristols, and poster paper has gone up a quarter of a cent. Red, dark blue, and green colors are practically unobtainable.

The sulphite situation grows steadily stronger although there are no changes in prices and purchasers are still buying in limited quantities. Ground wood continues rather dull and little new business is forthcoming outside of regular contracts.

In the rag and paper stock arena this is the dull season and there are no price alterations except in a few lines. White shavings are firmer while roofing stock is somewhat dearer owing to a recent demand. This is accounted by the fact that imported dark cottons, satinettes, etc., are being used abroad in the making of shoddy due to the scarcity of woolen materials.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.95 at mill, in carload lots.
News (sheets), $2.00 to $2.15 at mill, in carload lots.
Book papers (ton lots), 4.25 c. up
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.35 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.10 to $3.50.
Unglazed Kraft, $3.50 to $4.50.
Glazed Kraft, $4.50 to $5.50.

Pulp.

Ground wood pulp (at mill), $15.
Ground wood $19 to $22, delivered.
Sulphite (unbleached), $38 to $43 del. in Canada.
Sulphite (unbleached), $38 to $44, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. I hard shavings, $2.10.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 40c.
White blanks, $1.00.
No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.55.
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Folded News, 32½c.
Over issues, 40c.
No. 1 cleaned mixed paper, 22½c.
Old white cotton, $1.75.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.20.
Black linings, $1.25.
New light flannelettes, $3.75.
Ordinary satinets 90c.
Flock, $1.00
Tailor rags, 75c.
Blue overall cuttings, 3.37½.
Manila rope, 2½.
No. 1 burlap bagging, $1.00.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.

No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5½c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground wood, $20 to $23, delivered in United States. States.

NEW YORK MARKET REVIEW.

Special to Pulp and Paper Magazine.

New York, July 12, 1915.

Ground wood pulp has shown a tendency to improve within the past few weeks. Inquiries from paper mills serve to indicate that they are beginning to look for future supplies. Thus far, very little has been realized in the way of contracts, but it is expected that the end of the month may show a material change. Water supplies through New York State have been diminishing and it is expected that the paper mills will not be in a position very much longer to grind their own pulp. Reports from the West tell of continued heavy rainfalls, but they will have no effect on the situation.

The chemical pulp market continues firm with every indication of an advance in the near future. Importers are convinced that the movement of this market will be upward and are holding strong to the higher prices which are now prevailing. Conditions in Scandinavia seem to grow more acute from day to day. Difficulties which are now being met by the pulp mills appear to emphasize their statements that it will be impossible for any concessions to be made on the present quotations for some time. Coal from England is now more a problem than it has been since the war started. It is practically impossible to obtain coal in quantities from England and Scandinavia are beginning to look to America for their source of supply. This must necessarily entail a much greater cost than ever. Norway has just escaped from the possibilities of a lock-out which might have rendered untold harm to the pulp industry. For several months the painters and builders have been on strike and were unsuccessful in their attempts to arbitrate with their employers. About 15 days ago an edict was issued by the employers, who are strongly organized, stating that unless a settlement was made by July 7th, they would shut down all of the factories throughout the country and declare a general lock-out. On the ground of these possibilities most grades of chemical pulp took on added strength and reports were heard of various paper mills which sought to close contracts which have been pending. On July 6th, however, a cable was received to the effect that the crisis had been averted, and conditions had once more resumed their previous state. Krafts are dull and show little inclination to move. It is admitted that the stocks of krafts in this country are somewhat scarce and that they are not sufficient to survive a reasonable demand. Soda pulps are hard to obtain at any price. Easy bleaching is in fair demand, contracts being closed at $2.25 to $2.40.

The large number of concerns other than paper makers, who have come into the market for bagging is responsible, to a great extent, for the high quotations now being made. At the same time, it is known that there is comparatively little stock here and that future supplies are uncertain. Jute can hardly be obtained from India. Gunny is being sold at 1.85 and is very likely to advance in the immediate future. Bright bagging and sound bagging are inclining upward but do not reflect on the paper market. Manila rope is strengthening and is being quoted at $2.75 to $3.00. No relief has as yet appeared for the rag market. Domestic stock is being sold at prices in many instances far below the cost of English. The inactivity of the writing paper mills reflects strongly on this market. Roofing stock is practically out of the market for the roofing mills are running at very low capacity and are not taking any supplies. Very little imports are being received. Germany has declared an embargo on rags and is using every precaution to conserve its own supply. Belgium, from which large supplies have always come, is of course, unable to collect any stock. France and England have been shipping in small quantities because prices here do not pay them even for their labor. The writing mills, which consume the largest portion of this stock, are operating at about 60 per cent — it has even been hinted that they are running at a lesser capacity. However, regardless of the fact that rags are not plentiful and that new supplies are slow in coming, the market is exceedingly weak. Waste papers continue inactive.

During the past week, however, a little reaction was shown by mixed papers. Owing to a little unexpected demand the better grades of mixed rose to 20 and 22½c, while rumors were heard of dump mixed selling at 12½ and 15c.

The paper market, with but little exception is lifeless. Mill reports from all parts of the country impress one that they are averaging about 70 per cent capacity. Prices are low in most cases and few of the manufacturers are running on a really paying basis. Some are taking plenty of orders, but usually at concessions. Jobbers are complaining of the early Summer business that is, the premature arrival of the Summer dullness. Owing to the holiday, Independence Day, the past two weeks have been very weak. The strike at Watertown, N.Y. is beginning to be seriously felt in newsprint. Both the mill men and the strikers have shown determination to hold out in their demands so that it is likely that many of the machines will continue idle for sometime. Although strike breakers have been engaged to operate several of the mills, a large tonnage has already been taken out of the market which has served to strengthen it. Contracts at pre-

sent prices are almost impossible, for manufacturers are confident that an advance is certain. Supplies have been coming in from Canada but have not made a deep impression on the local situation. Side runs are firm. The strike has brought about a condition which has taken much of the stock out of the market so that there are now in New York city but one or two firms who are in a position to sell side runs. Quotations have been withdrawn. Although no changes have as yet been made in prices, it is undoubted that if, the strike should continue much longer, an advance will be in effect. Tissues are decidedly uncertain; just now the market is dull and prices are exceedingly weak. It appears that jobbers have bought up large stocks when the break first occurred sometime ago and that they are now well supplied. It is possible that the sulphite situation may make itself felt in tissues. The growing strength of sulphite must affect the cost of manufacture of tissue. Contracts for No. 1 White are reported at 37½c. A rumor circulated recently stating that one mill was prepared to name 40c as minimum price for this grade of goods. However it is hardly likely that such action will change matters to any extent for it is now expected that business will improve before the fall. Several complaints are still being received from manufacturers of Manila tissue on the score that they find it difficult to secure coloring. The demand is fair. Colors in deep tints are almost impossible to obtain. The fact is that no encouragement is being given the buyers of these goods. The market is holding firm and shows an inclination to advance. Toilet paper and crepe papers are in brisk demand. Manilas are selling very poorly and at low prices. Fibres are not in demand; however, there have been no recent reports of shading. The volume of business in paper bags is decidedly small. Manufacturers are trying to hold by the new prices, but several reports have already been received of shading. There is little possibility of any added life for some time owing to the fact that jobbers are almost invariably well supplied. Book papers are inactive. Transactions are being made at low figures and cutting is being resorted to in many instances. Boards are lifeless and are not showing any tendency to improve. The mills are running far below normal capacity.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine.)

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.75c to 1.95c, delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.60 to 2.90, ex dock, N.Y.
Easy Bleaching, impt., 2.10 to 2.25c, ex dock, N.Y.
Easy Bleaching Pulp from 2.15c to 2.20 to 2.10c to 2.25c.
Unbleached sulphate, impt. 1.80c to 2c, ex dock, N.Y.
Bleached sulphate, impt., 2.75c to 2.85c, ex dock, N.Y.
Kraft Pulp, $1.85 to $1.95

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, supertine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

CANADIAN PAPER AND AUSTRALIA

A discussion of considerable interest took place at a recent meeting of the Australian Provincial Press Association on a resolution providing that the Commonwealth government be urged to place white news paper manufactured in all parts of the Empire on the free list. One of the speakers contended that the Canadian paper should receive the same concession that was granted to paper imported from the United Kingdom. He pointed out that news printing paper made in Great Britain was manufactured from pulp imported from Norway and Sweden, where a large number of the paper and pulp plants were controlled or financed by Germans. British mills were really pulp converters and not manufacturers of the article in the same sense that Canadians were. In Canada the entire process from the tree to the finished article was carried on. He further explained that if Canadian paper obtained a preference in Australia, Canada could take over all German, Austrian, Swedish and Norwegian contracts immediately. In this connection he made special reference to a large mill which was operating in British Columbia.

On the day following the discussion outlined above a deputation waited on the Prime Minister and recommended that paper from Canada be admitted to Australia free. The Hon. Mr. Fisher said that Australia was prepared to enter into a general reciprocal arrangement wit hCanada, while the Minister of Customs amplified this with the assurance that negotiations between the two had been re-opened.

PRICES RAISED IN SCANDINAVIA

The Secretary of the Svenska Pappersbruksforeningen, has issued the following notice:

In order to discuss the situation the Norwegian and Swedish manufacturers of Cellulose papers particularly Sulphite, Kraft Sealing and M.G. Cap papers have had a meeting in Christiana the 9 and 10 of June.

In view of the increased cost of manufacturing caused chiefly by the enormous rise in prices of almost all raw materials and supplies used in the process of papermaking, it was found necessary to raise the prices for different qualities from 10 to 20 per cent. From several quarters the opinion was expressed however that this advance was not sufficient to cover the actual extra expenses.

TENDERS FOR PULPWOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway west of Lac Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council, for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near that territory, and to manufacture the wood into paper in the Province of Ontario — the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,
Minister of Lands, Forests and Mines, Toronto, June 5th, 1915.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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ROY CAMPBELL, B.A., B.Sc.F., Editor.

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The Technical Sections

The efforts of the Technical Sections of the two national pulp and paper associations in America will be crowned with great success if their present activities may be taken as an indication. The Section in the United States has already inaugurated an essay competition open to men in the Union and the Dominion, and the Canadian Section, through its Executive, has set about forming committees on various questions, which require concentrated attention.

Our good friends in the sister country have had the excellent judgment to select for the competition eminently practical subjects, viz., the deterioration of machine wires, the elimination of pitch in sulphite pulp, the effect of order and time in furnishing on the retention of color, and the retention of mineral fillers, with their effect on machine clothing and paper quality.

These are questions which have long tantalized manufacturers in the various lines affected. Small fortunes have been lost because of an incomplete understanding of some of these problems, and conversely, fortunes await those who shall solve them with a greater degree of success than has been attained in the past. The prize of one hundred dollars which will go to the successful contestant in each question is liberal. It may not begin to pay a man for his time, but it is well worthy of the earnest effort of those who enter the competition. As a vigorous advertisement recently published in an esteemed contemporary suggests, there is an opportunity for those who participate to add their names to those who have made the paper industry one of the foremost of the world. Those masters who have invented processes or perfect machines—Reamur, Robert, Fourdrinier, Tilghmann, Mitscherlich, and many others, hold positions of great honor among pulp and paper men. But no one for a moment imagines that the end has come. Indeed, the pulp and paper industry is vibrant even now with tales of new discoveries, and the possibilities of development.

Among the best of these will be the reducing of expenses through the common sources of loss so well-known to all manufacturers, and the development of ideas similar to those indicated in the list of subjects proposed by the American Technical Section. The fact that the successful papers of this contest will be published in the report and in the official organ of the Section, will ensure to the successful candidates prominence and due honor for their efforts, and by putting this investigation on the high place which it has, the Technical Section is ensuring for all those who care to participate the favorable attention and warm co-operation of all owners and managers of pulp and paper mills. The success which has attended the development of the parent organization, the American Paper and Pulp Association, will find reflection in the present endeavor.

Hardly less important in relation to the development of the industry, is the appointment of Committee on Standards and Testing, Statistics and Information, Technical Education, and Collection of Samples, which has just been entered into by the executive if the Canadian Technical Section. As was indicated at the meeting in the month of June, the work of the committee on Standards and Testing, is extremely wide, and very important. The question of the testing of moisture in pulp, for instance, is one which has engaged the cleverest minds for many years, and even though several conferences have been held upon the subject, no method, which all buyers and sellers of pulp feel is thoroughly adequate, has been devised. Much remains to be done in the work of testing along lines of strength,

etc., in papers. Standards of measurements in many departments have not been fully elaborated, nor have the standards of testing for incoming materials been thoroughly lined up. Investigation by the committee to be appointed, followed by discussions and co-operation to whatever degree possible, will do an infinite amount to make the standards of papermaking firmer and higher. The adoption of proper standards and methods of testing will undoubtedly assist also in the development of costs systems, the lack of which is one of the greatest hindrances to the pulp and paper industry as a whole. There should not be any such "rule-of-thumb" method as that quoted by a prominent American paper manufacturer, who said that he knew of mills who proceeded upon the basis that the price of paper equalled the price of rags, plus five cents, or double the price of rags.

The work of the committee on Technical Education is one of the most important now before the pulp and papermakers in Canada. Everywhere are heard expressions of the deepest interest in the work of technical education in other countries and in other lines, and it seems to be universally accepted that the Canadian industry should endeavor to get some form of technical education as quickly as possible.

The work of the committee on Statistics and Information can be broadened to a service whose value can hardly be computed. The shedding of greater light from all sources upon the work of every day, and the comparison of output and methods with those of other papermakers in foreign countries, should give a strong basis for steady improvement.

In the collection of samples of papers made in the Dominion, to which special committee is being assigned, Canadian manufacturers will secure a bird's eye view of the industry.

We repeat: the efforts of both Technical Sections give promise of great success, judging by present activities. It is to be hoped that the work which they have set out to do, will receive the hearty support of every person who is in a position to assist.

The Public Conscience

It is hardly within the province of this periodical to speak of municipal and provincial politics, still less it is becoming to preach a sermon. However, in the two investigations which are being conducted in the Cities of Montreal and Winnipeg into the rotton political methods surrounding the franchise of a street railway company, and motor bus company, and the resignation of the provincial government of Manitoba respectively, there is a basis for a most urgent appeal to all good living citizens to take warning by the terrible examples of misuse of authority, which are clearly evident.

It would appear from the scandals which have been aired in the Dominion of Canada during the past decade, and particularly in the past two years, that the public conscience is practically dead. The last session of Parliament witnessed charges against one member by another in connection with railway matters, which under any ordinary system of honorable and gentlemanly conduct, deserve either that every charge be proven, and the person at whom they were directed expelled from public life in disgrace, or that the person who made such declarations against the character of another, should be banished from the land.

Graft has existed since prehistoric times, but it would appear from the trials which the Dominion of Canada has been suffering in misappropriation of funds, slick work in promoting wild-cat schemes, direct stealing of public funds, misuse of power for a consideration, and all sorts of petty thieving, even among members of Parliament, as has been substantially proven by the recent investigation at Ottawa, are far more severe than anything which the world has seen in the past two decades at least. Honorable men shrink from politics, many shrink even from voting, because of the hypocrisy and political intrigue which they see permeating every province of the Dominion.

The fault is not to be found in the minor systems of political life, as is claimed by many. Time and again in the history of America, a city or state has been "cleaned up" by reformers and a new system installed, but "the boys" learn to "beat the game," and abuses spring up as badly as before.

Public conscience needs rejuvenating, it needs the impress of the example of the influence of high-minded men. A line or two from a Dominion Day poem in the Toronto "Globe" are worth repeating: — "It rests with those who rule us now to leave their impress there—the stamp of true nobility, high honor, stainless truth; the earnest quest of noble ends; the generous heart of youth."

But in the last analysis this country is dependent upon the thoughts and the attitude of the whole Democracy, and there is no way of working up responsible public conscience, and a strong public morale, except by increasing it among members of our Democracy individually. People who think that politicians are inherently dishonest can simply swallow the pill of their own making. A well-governed country is dependent upon good citizens. And Canadians can improve considerably.

Enter Abitibi

Paper has begun to roll forth from the Abitibi mill. Newsprint manufacturers the country over will congratulate PresidentAnson upon the attainment of this stage of development. With its vast resources of pulpwood, cheap power, excellent plant and careful management, Canada's newest and largest mill should thrive wonderfully. Certainly this will be the hope of all whom Pulp and Paper Magazine reaches.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Servi

The Abitibi Power and Paper Co., Limited.

Pte. CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action Feb. 28th, 1915.
Pte. WM. SMITH.
Pte. WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
Pte. GEO. ALBERT BROWN.
Pte. C. V. PERRY.
Sergt.-Major E. C. MORRIS.

Bird & Son.

JAMES BOATH
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GLIDDEN CAMPBELL.

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford & Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.

Kinleith Paper Company, Limited.

CAPT. C. STEWART-PATTERSON.
GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

The Laurentide Company, Limited.

M. JEAN ARHAN.
M. FRANCOIS DURCHER.

Price Bros. & Co., Limited.

G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. A. MOAT.
J. C. EAGLES.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. BERNIER.
A. AMY, Jr., killed 31st May.
E. LEDGER.
J. HOOD.
S. HARTLEY.
G. LANE.
R. DONCET.
C. CONLEY.
S. LAPIERRE.

St. Croix Lumber Co.

FRED BOUCHY.
CLIFFORD WHEADON.
BERT McMULLEN.

St. George Pulp and Paper Company.

HARRY HEWITT.
GORDON GRAY.
ROBERT GRAY, Jr.
ARTHUR HATT.

Spanish River Pulp and Paper Mills, Limited.

L. FINCH.
W. P. L. FOOT.
OLIVER DENMAN.
M. L. COTGRAVE.
E. COLLINS.
C. MARTIN.
HOWARD N. REID.
P. VENN.
GEO. WICKENDEN.
HAROLD LOCKWOOD.

Toronto Paper Manufacturing Co., Ltd.

ALLEN FORBES.
JOHN GIRARD.
MIKE COLBORNE.
Z. MARTIN.

The E. B. Eddy Company, Limited.

F. T. SEAR.
A. F. CLARKE.
WILLIE SMITH.
EDWARD LONGPRE.
ALPH. FOURNIER.
A. BRANCHAND.
EDWARD PERRY.
J. C. FARISH OWEN.
THOMAS OUELLETTE.
LEANDRE CHEVRIER.
E. S. HUBBELL.
JOSEPH DESORMEAUX.
THOMAS ALBERT KELLY.
J. E. FRASER.
CHAS. COVELL.
EDWARD COLLINS.
ISODORE GAUDREAU.
OVILA FOURNIER.
GEORGE MORRISON.
WILLIAM CRAIG.
W. S. GOODEVE.
HARRY FRANCIS.
HERBERT LOVE.
JOHN MOORE.
JEAN DESJARDINS.

This Roll is not complete. Many firms have not yet sent in full lists, and some have sent none at all. We urge upon those who are in a position to send in names, photographs or particulars of those who have enlisted to do so at once. The intention is to keep the Honor Roll standing until the end of the war.

SAFEGUARDING MACHINERY FOR MAKING PAPER

By EDWARD T. WALSH, M.E.

Since the advent of the workmen's compensation laws efforts have been made to eliminate hazardous conditions and safeguard the dangerous points about all machines which enter into the manufacture of paper. In some of the States the workmen are being reached and induced successfully to take an active part in the work through the organization of committees among employees, with prizes offered for acceptable suggestions, thereby leading the men to understand the importance of considering caution and safety.

That unsafe practices and conditions had arrived at a point where it was necessary to take some action toward improvement was indicated by a report on accidents in paper mills which was compiled by the Wisconsin Industrial Commission. The report covered a period of two years and a total of 5,000 employes. In that period 1,307 accidents happened, or one accident to every 4 persons employed. It was estimated that the total cost of the accidents would have amounted to more than $175,000, not including the value of each day lost. The chart shows this report arranged graphically.

It is almost impossible to eliminate some of the hazards, such as restricted working spaces around machines, but others, such as poor floors, stairs and walkways, and indifferent lighting, are being remedied rapidly. The floors, etc., are being put in shape by the mechanics employed in the mills, but the lighting is being handled along scientific lines by lighting engineers.

Elevators, which were neglected heretofore and were sources of constant danger, are being equipped with safety devices, such as locks at each story, enclosures, with proper doors or approved trap doors and guard rails.

Emergency stops are being placed on or about the machines where they are handy to the reach of the operatives. The stops act directly on the engine or other motive power, and they are positive in their action.

Aside from the safety to operatives, stops, like those mentioned, safeguard the machine, because it can be stopped instantly if some foreign material gets into its moving parts.

Signs reading "Keep Off! Men Working on This Machine" are displayed on machines which are being repaired.

The hazard of scuffling or horse-play is well known to all who have to do with men. There is no other source of injuries so hard to eradicate. It should be prohibited under severe penalty and the penalty exacted in the event of the breaking of the rule.

Belts, pulleys and shafting are being guarded with railings, boarding or expanded metal enclosures and gears are being enclosed completely, whether they run out or in.

To avoid turning heated liquors, steam or acids into receptacles or pipes and injuring men who may be working in or about them, it should be made compulsory to sound a signal of warning. The blowing of a whistle or the ringing of a bell serves the purpose.

In "Safety Engineering," New York.

Ventilation is receiving more attention now than heretofore. It was found to be necessary because of the excessive moisture which gathers in and about the machine room of a paper mill and causes damaged paper. In regard to ventilating rag sorting and threshing rooms the Wisconsin Committee on Orders Covering Specific Points in Paper Mills said: "All rag sorting tables where operators stand and sort rags and other materials which throw off dust, must be equipped with an efficient exhaust system. All rag cutting and rag threshing machines must be located in rooms separate from any rooms in which other work is being done." The committee is composed of paper mill operating men almost exclusively, and the recommendation, coming from such a source, indicates the importance of eliminating the dust hazard.

Smoking in and about a mill is prohibited usually for the work force. The rule should extend to the office force. A man who is stealing a smoke is likely to throw away the butt of his cigarette or cigar when a foreman approaches, without considering where it will land, or whether it has been extinguished or not. There is no question that the results of the habits of smoking have caused numerous fires.

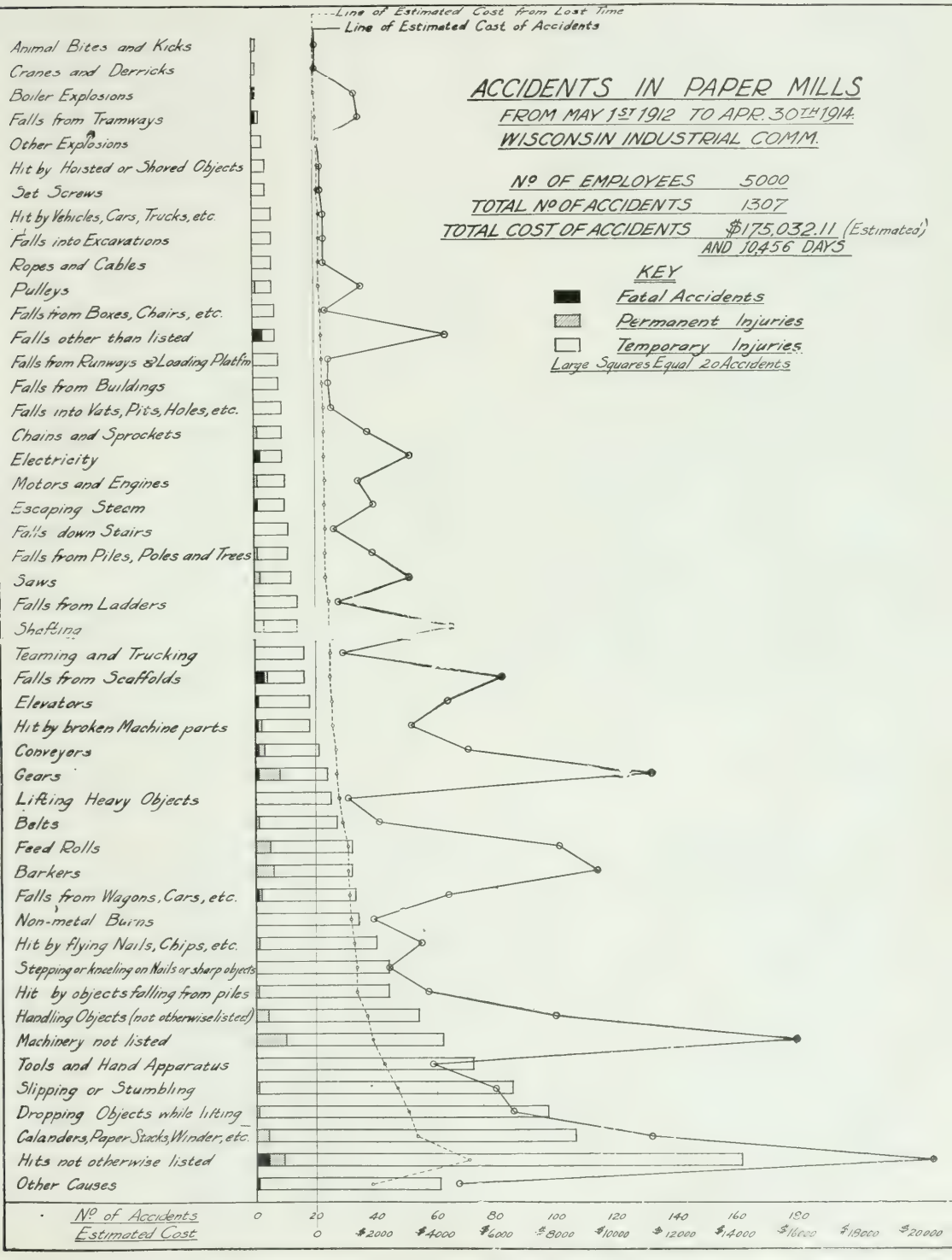
Lack of management in enforcing the observance of rules for safety is a factor of accidents. Rules made in some plants become dead letters soon; the men know they can ignore them with impunity, and they do so. In other plants the operatives know that a breach of the rules means instant penalty. Foremen can be a power for good by being particular to observe all rules for safety and to direct workmen for doing the same.

In the operation of sorting rags there is practically no mechanical hazard. The sorting table should be equipped with an efficient exhaust system. The rag cutting machine offers considerable hazard from its feeding mechanism and drive. It was recognized by the manufacturer of one machine and he safeguarded his machine, as shown in Fig. 1. The sprocket chains and wheels which operate the feed rolls are housed with substantial sheet-metal guards. It might be an advantage to have the feed rolls of cutting machines covered, the cover to extend over the feed trough far enough to prevent an operative from touching the feed rolls with his hand.

Dusting machines, rag threshers, willows, etc., offer very little hazard if the driving belts are guarded. Where conveyors are used to convey the rags from one machine to another they should have the drives guarded with wire-mesh or expanded-metal guards. Fig. 2 shows a railroad duster, with driving belts and pulleys guarded. The high quality of the guard may be noted.

If the bleach liquor used in the boilers is introduced cold, great care should be used not to turn steam on too quickly. It is better to have the liquor heated. The worms and gears should be housed and the driving belts and pulleys guarded.

The drives of the breakers and beaters should be housed in an approved manner. Fig. 3 shows an almost ideal example of such housing. The housing over the rolls should be sturdy enough to resist the knives, if thrown out of the roll by the breaking of a band. The


Line of Estimated Cost from Lost Time
Line of Estimated Cost of Accidents
ACCIDENTS IN PAPER MILLS
FROM MAY 1ST 1912 TO APR. 30TH 1914.
WISCONSIN INDUSTRIAL COMM.
No. OF EMPLOYEES 5000
TOTAL No OF ACCIDENTS 1307
TOTAL COST OF ACCIDENTS $175,032.11 (Estimated)
AND 10,456 DAYS
KEY
Fatal Accidents
Permanent Injuries
Temporary Injuries
Large Squares Equal 20 Accidents
Animal Bites and Kicks
Cranes and Derricks
Boiler Explosions
Falls from Tramways
Other Explosions
Hit by Hoisted or Shoved Objects
Set Screws
Hit by Vehicles, Cars, Trucks, etc.
Falls into Excavations
Ropes and Cables
Pulleys
Falls from Boxes, Chairs, etc.
Falls other than listed
Falls from Runways & Loading Platfm
Falls from Buildings
Falls into Vats, Pits, Holes, etc.
Chains and Sprockets
Electricity
Motors and Engines
Escaping Steam
Falls down Stairs
Falls from Piles, Poles and Trees
Saws
Falls from Ladders
Shafting
Teaming and Trucking
Falls from Scaffolds
Elevators
Hit by broken Machine parts
Conveyors
Gears
Lifting Heavy Objects
Belts
Feed Rolls
Barkers
Falls from Wagons, Cars, etc.
Non-metal Burns
Hit by flying Nails, Chips, etc.
Stepping or kneeling on Nails or sharp objects
Hit by objects falling from piles
Handling Objects (not otherwise listed)
Machinery not listed
Tools and Hand Apparatus
Slipping or Stumbling
Dropping Objects while lifting
Calanders, Paper Stacks, Winder, etc.
Hits not otherwise listed
Other Causes
No. of Accidents
Estimated Cost
0 20 40 60 80 100 120 140 160 180
0 $2000 $4000 $6000 $8000 $10000 $12000 $14000 $16000 $18000 $20000

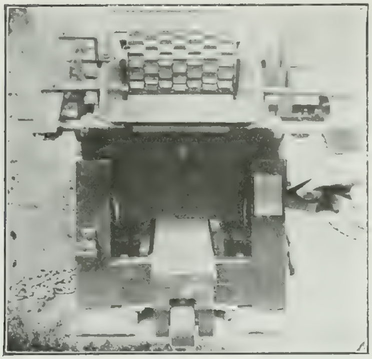


Fig. 1.—Rag Cutting Machine, with Feeding Mechanism Guarded.

belts, pulleys and gears which operate the washers should be guarded.

Jordan, or refining, engines offer, in themselves, little hazard. The flexible coupling used between the motor and the engine on a direct connected unit should be enclosed entirely. The end of the shaft which extends beyond the casing should be covered with a cap.

Vertical tanks, as used for stuff chests should have their tops 3½ feet above the floor or be boarded over with heavy plank, with guarded trap doors for access. The gears that operate the agitators should be housed so that an operative cannot put a hand or an arm near them. Operatives should be required to remove the belt which operate the agitators before they enter the tanks for any purpose. A sign on the machine will be an additional safeguard.

All pumps should have driving mechanism housed or provided with guards of approved standards.

The screens should have a guarded walkway at the sides, if they be placed close together, or a substantial one between and across the ends, if separated. The drives should be guarded.

At the back of the machine the numerous drives that operate the cylinders, fourdrinier presses, driers, calenders and reels offer problems of safeguarding. In some cases protection has been provided by placing pipe railings around the floor drives, as shown in Fig. 4. Apparently pipe rails offer an additional hazard of being torn down and thrown into the machine in the event of a broken belt, particularly where the drives are from

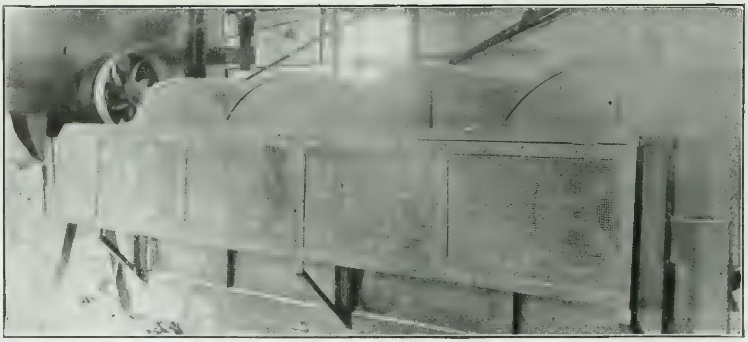


Fig. 2.—Railroad Duster, with Driving Belts and Pulleys Guarded Efficiently.

Fig. 3.—View of a Beating Room, Showing How the Drives of the Beaters Are Guarded.

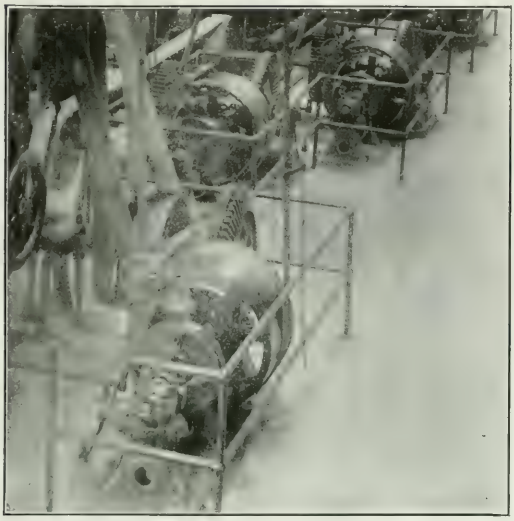


Fig. 4.—Floor Drives at Back of Machine Enclosed by Pipe Railings.

Fig. 5.—Floor Drives of Driers, with Wire-Mesh Guards.

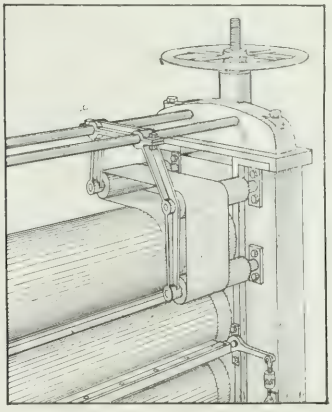


Fig. 6.—Feeding Belt Over Top Roll of Calenders, to Be Used When Paper Is Fed Over Top Roll.

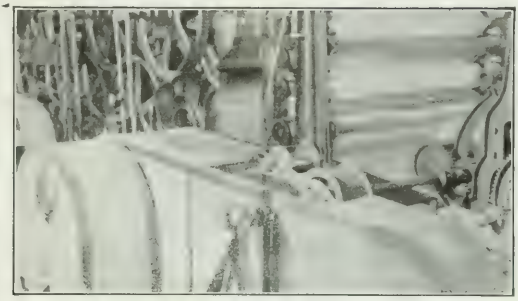


Fig. 7.—Floor Drive for Reels, with Wire-Mesh Guard.

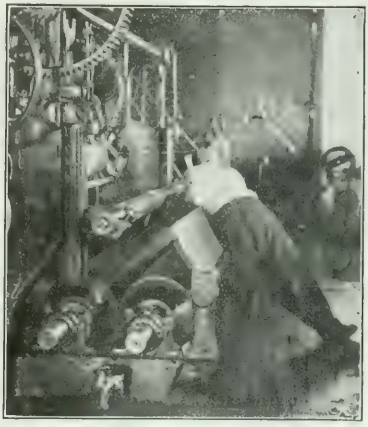


Fig. 8.—Drum Winder, with Plank Up to Guard Against Nip Between Drum and Roll of Paper.

Fig. 9.—Drum Winder, with Plank Guard Down for Removal of Roll of Paper.

overhead. Fig. 5 shows the floor drives enclosed in wire-mesh guards.

All foot boards over the fourdrinier and presses should be equipped with handrails secured to the frames of the machines. If the rails are secured to the footboards the boards should be bolted fast, so that a man leaning against the rail will not overturn it.

Washing felts on the presses form a hazard to a considerable extent. In some mills the felts are removed

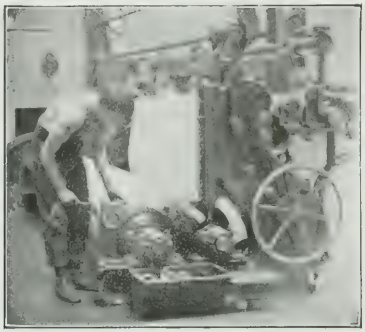


Fig. 10.—Dangerous Practice of Running Cord on Winding Shaft to Cause Paper to Reel Evenly.

and washed on a machine; duplicate felts are kept in reserve, it takes only a short time to make the exchange. It is claimed that changing is more economical than doing the work while the felt is on the machine. In mills where it is the practice to wash the felts on the machine it is the rule to rope and pull the felts out in front of the rolls, never behind them. The machine is run slowly and a man is at the starting lever to stop it on the instant in case of trouble.

Footboards from sill to sill of the press over the pit should be provided for use in removing the felts. It is a good practice to place footboards behind the doctors on the press rolls. They may be secured to the frame that carries the rolls.

The felt rolls on the driers should be placed at least $4\frac{1}{2}$ inches away from the driers. It is understood

Fig. 11.—Handle on Hook of Crane Yoke to Prevent Man's Hand Being Caught Between Roll of Paper and Hook.

that such placing is impossible on existing machines. The fact should be considered in the future design of driers. Such placing is particularly desirable on high speed news machines in plants.

The gears at the back of the machine which operate the driers should be housed and the arms covered with a wire-mesh guard. Oil cups, with pipes leading to the bearings, should be placed on top of the frame. Both ends of the machine should be guarded to prevent any one falling into the pit. The first felt roll should

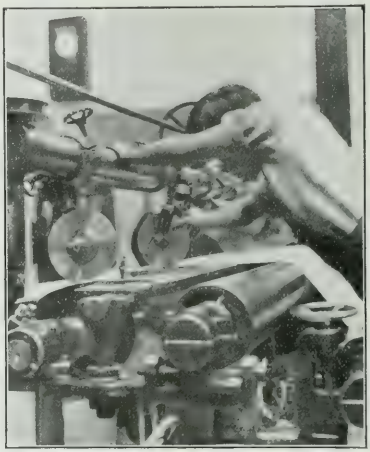


Fig. 12.—Dangerous Practice of Adjusting Slitters by Hand.

be guarded with a heavy wire-mesh guard and a guard should be placed at the baby drier, if one is on the machine. If a doctor is used on the first drier it acts as a safeguard in place of the one mentioned. The Wisconsin committee, mentioned in the foregoing, recommends this: "On all paper machines, with drier

Fig. 13.—Adjusting Slitters by Means of a Stick Provided for That Purpose.

felts, each lower drier must be equipped with an efficient doctor."

After driers have been out of commission for a period care should be taken to warm them thoroughly before turning on full head of steam. The machine should be turned over slowly while steam is admitted to the drying cylinders through a cracked valve.

A substantial footboard should be provided to extend from the driers to the end of the press. It should be secured to the drier footboard in such a manner that it may be swung out of the way when not in use for leading the paper from the press to the drier.

On driers of extremely large diameter a guard rail, from frame to frame, should be provided to give security to the man passing the paper, but it should not be placed so high as to interfere with his work.

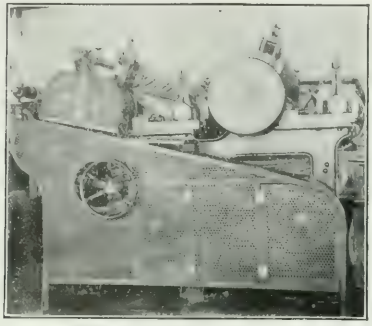


Fig. 14.—Belts, Pulleys, Etc., Guarded on a Duplex Cutter, with Perforated Sheet-Metal Guard.

Steam pipes where men work should be covered so that if a man should catch hold of a pipe to save himself from falling he would not be compelled to let go. Aside from the point of safety to the operatives, the covering is a source of economy.

Fig. 15.—Wire-Mesh Partition Around Duplex Cutter Gears. Partition Up and Out of the Way so That Gears Are Accessible.

The calender stack has the reputation of being the most dangerous machine in use in the making of paper. Most of the accidents caused by the machine are of a minor nature, but many have been serious and some fatal. The paper must pass between the rolls of the machine while they are running at a very high speed. The rolls must be kept polished and the slightest particle of size or other material must be removed immediately or the finish on the paper would be damaged. While removing the particles operatives have had their fingers caught in the rolls. Accidents happen also when they pass the paper between the rolls.

Fig. 16.—Wire-Mesh Partition Around Duplex Cutter Gears, Partition Covering all Gears.

Quoting again from the recommendations of Wisconsin committee concerning calenders: "On all machine calenders used in paper mills except super-calenders, each roll must be equipped with an efficient doctor"; also, "on all machine calenders . . . . where the paper is taken over the top roll to be fed into the first nip, a feeding belt or other efficient device must be provided to conduct the paper into the first nip and thus make it unnecessary for the operative to use his hands in this dangerous place."

Fig. 17.—Perforated Sheet-Metal Guard on Single Cutter.

A feeding belt, like that specified, is shown in Fig. 6. In Germany the nips of the rolls are guarded with either an angle or round rod close to the nip, with only enough room to pass the paper through.

It is the best practice to have the reels constructed

so that they may be removed from the frame for rewinding. There should be prohibition against the winding of one reel and the unwinding of another from the same frame at the same time. The committee recommended that "the winding reels used with the paper machine in paper mills, where the rolls of paper run in, must be guarded or the reels must be constructed so that it is impossible to have less space than 8 inches between the reels of paper when they reach the maximum size. In order to limit the space between the reels a permanent stop may be placed below the bottom reel and above the top reel, which will limit the size of the reel."

The drives of the reels should be guarded in an approved manner. Fig. 7 shows how one mill did the work.

Where the drum and the roll of paper run in together on drum winders the nip or ingoing side must be guarded. Fig. 8 shows a winder equipped with a protecting plank to guard the nip, the plank being up. Fig. 9 shows the plank down and out of the way to allow a roll of paper to be removed.

The practice of winding a cord on the core shaft to cause the paper to reel evenly should not be permitted. Fig. 10 shows an operative in the act of using a cord. On the market is a patent collar that clamps on the shaft and keeps the paper where it belongs.

Paper may be threaded through the drum winder in such a manner that the drum and the roll of paper will run out, in which event the guards at the nips may be dispensed with.

In handling the rolls of paper by means of yokes operatives sometimes get their hands injured by being

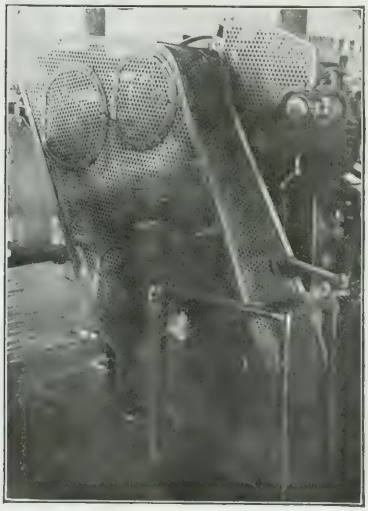


Fig. 18.—Perforated Sheet-Metal Guard About the Gears and Drives of a Cutting Machine.

caught between the hook of the yoke and the roll which slides on the winding shaft. Fig. 11 shows how the hooks on one yoke were fitted with handles to eliminiate the hazard.

The practice of adjusting the slitters by hand while they are in operation, as shown in Fig. 12, should be prohibited. A stick should be provided for that purpose and the use of it insisted upon. Fig. 13 shows how the stick is used.

Boards should be placed behind the squeeze rolls of cutters and slitters so that the paper may be passed through without the danger of getting caught in the squeeze rolls.

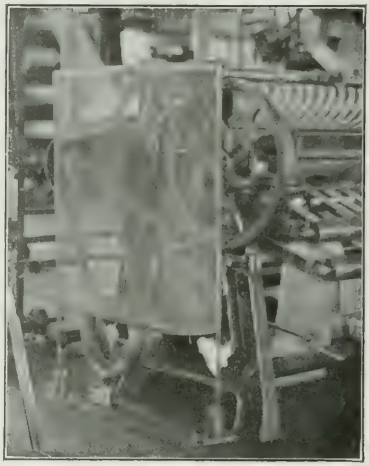


Fig. 19.—Removable Wire-Mesh Guard Around the Gears of a Cutting Machine.

The drives of the knife rolls on the single and duplex cutters should be guarded. Fig. 14 shows one side of a duplex cutter guarded according to one man's idea of how it should be done and Fig. 15 shows another guarded machine, with a wire-mesh partition which can be raised out of the way to get at the mechanism. The figure shows the guard out of the way and Fig. 16 shows it down, covering the gears.

Fig. 17 shows a single cutter guarded with perforated sheet-metal guards. Doors are fitted where necessary to get at the gears for adjustment. The doors are shut normally, and they must be held open. Fig. 18 shows another make of cutter, with perforated metal guard.

Fig. 19 shows another form of guard, which is held in position by sockets on the floor.

STRIKE AT DONNACONA MILL OVER.

The production of newsprint at the Donnacona Paper Company's mill was resumed on July 19th. About a month ago a sympathetic strike was declared by the Donnacona Paper Company's employees, and about 150 men walked out at the demand of the union on account of labor troubles in some of the northern New York paper mills. There was no discontent, and no demands at Donnacona, yet out of the 175 employees all went out except 25 or 30, and the mill was completely shut down for several weeks.

Law and order were maintained throughout by General Manager McKee, with the assistance of special officers and the provincial police. Department after department was started up with new employees, and the strike is now practically over, and the mill in complete operation with new employees. The production is about 46 or 47 tons per day, or about 90 per cent. and Mr. McKee stated to the Pulp and Paper Magazine on Wednesday last that production would be normal by the end of the week.

THE DETECTION OF LOSSES BY FORMULATING A BALANCE

By C. C. HERITAGE, Chem. Eng. Port Edwards, Wis.

(Written Specially for Pulp and Paper Magazine.)

The practice of applying the balance idea in order to locate losses and ascertain efficiencies throughout a given process is one that is well established in many industries, more especially in those of a chemical nature. The balance is brought about by simply ascertaining the quantity of the particular constituent under study which enters the process, and checking this against all removals of the same, whether as losses or as part of the finished marketable product. In other words a ledger page is filled out with debit and credit entries. The constituent is debited with the quantity which is given into the process whether all at the start or at various times throughout its manufacture. The credit entries will then consist of losses plus finished material. If there should be no losses the page would show theoretical efficiency or 100 per cent., and this figure would be lowered in proportion to the losses found to exist.

When all losses of the constituent in the process and the amount of constituent in the finished material are totalled, this sum should, of course, balance the quantity of the constituent entering the process. This is seldom the case, and therein lies one of the greatest values of this so-called balance. The two sides of the ledger page or "account" will show a discrepancy always in favor of the debit side, or in other words, of the constituent entering the process, unless the measurements and determinations have not been carefully and properly performed. It must be understood axiomatically that accuracy is of the utmost importance in carrying out a balance of this nature. This discrepancy then simply means that there is a loss somewhere in the process which at the time of making the balance is unknown. Thus new problems are opened up, and these losses must be located which otherwise would very likely not be brought to light at all by any casual haphazard investigation.

It is the ambition of every manager, superintendent, or engineer to locate losses in the process under his supervision and in an efficient plant these must be eliminated or reduced to a minimum. It is, therefore, plain why this matter of forming a balance on each constituent as above outlined serves this very purpose and when properly carried out places the proposition in black and white, so that the operator may see at a glance where the losses are, which are the largest, and therefore upon which labor and energy must be expended to effect a reduction.

It is in no case a simple matter to go into any industry and after selecting the constituent for study, to proceed quickly to the final results. The first step, of course, is to diagram the process with direct regard to the constituent to be balanced. In many cases the physical state or phase will change, involving any two, or possibly all three, solid, liquid and gas. As it is necessary to measure not only quantity of material but also composition, the engineer needs to select both instruments to measure the quantity of the phases passing and methods of sampling and determination to secure data on composition. Having outlined the mode of attack and selected the instruments and methods, it becomes necessary to secure these and install them at the least expense compatible with accuracy. This is often the most difficult part of the problem and much preliminary work must be done before every unit has been proved out so that the final run may be made without error or interruption, material measured and analyzed, upon which data the balance is to be calculated. So that it must be understood that the balance is not to be arrived at without expenditure of time and money. The results obtained should in all cases amply repay this, however, for even though the improbable state of affairs should exist that the losses be very small, this result should indeed be worth knowing, and knowing accurately in black and white. This constituent, therefore, showing high efficiency may be permanently shelved so long as the process is carried on unaltered. Further study may then be concentrated on other constituents.

When once the balance has been completed, work should be begun on the reduction of the large losses which have been shown to exist. Some operators insist that some losses are inherent and cannot be eradicated. This is true in cases where a chemical reaction takes place, which results in a useless by-product, but if the problem be studied sufficiently diligently, it must finally yield to some solution, perhaps the utilization of the by-product. Of course it is impossible to attain a perfect efficiency, but it is also true that there still exists the problem of cutting down loss as long as 100 per cent or thereabouts is not attained.

The balance idea as applied in the metallurgical industries is usually concentrated on the heat constituent and the figures given in Table I. are taken from a heat balance run on a small foundry cupola which will serve as a good example. The discrepancy in this case amounts to 4,670 Cals. or about ¼ of 1 per cent, which is a very close agreement in the two sides of the "account."

Table I.—Heat Balance on Foundry Cupola.

Item.	Calories Debit.	Calories Credit.
1. Coke charged	1,564,500	
2. Oxidation of Silicon	21,000	
3. Heat of Formation of Slag	177,650	
4. Heat of Formation of Cementite	4,230	
5. Out with Molten Iron		498,500
6. Out with Gases		636,200
7. Left in Cupola Body		68,000
8. Latent Heat in Co		507,000
9. Radiation		110
10. Out with Slag		23,370
11. Out in final drop		29,530
	1,767,380	1,762,710

The losses appearing on the credit side are the items from No. 6 to 11 inclusive and it is seen that there is plenty of opportunity in this case to eliminate loss. Further discussion of this data would be out of order in this place.

Some applications of the balance idea in the pulp and paper industry may be noted as follows: The largest application is to the largest item of raw material, the wood. It at once comes to mind that the yield per cord gives the efficiency of this constituent. It would, indirectly, except that unfortunately the unscientific and impractical unit of measurement, the cord, can-

(Concluded on page 419.)

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

F. L. RATCLIFF,

President Ratcliff Paper Co. Ltd., Toronto.

"Well, you can come to work, but don't be surprised if you are fired", remarked the head of an old-established paper firm to the boy who had called seeking a position.

This incident happened twenty-eight years ago, and the ambitious lad, who was not afriad to take chances, is to-day head and owner of that same establishment which has just removed into larger and more commodious quarters, owing to the steady growth and expansion of business. Then, in his early teens, the youth had come up from Peterborough on a visit to friends in Toronto. The time limit of his ticket had almost expired, and reading an evening paper he noticed that Tay-

lor Bros., 30 West Market Street, wanted a boy who could make himself useful around the warehouse. The applicant was not very large in stature, and is not to-day — but he was active, healthy, and willing. His father, a Baptist clergyman, wanted him to enter the ministry. The son wanted to be a merchant, as at school he was always playing storekeeper and trading with fellow pupils. His fondest dream was to get into business some day for himself. Finally father and son compromised, and it was agreed that the latter (who was attending the Collegiate Institute in Peterborough, then under the direction of the famous Dr. Tassie), would be a doctor. There the matter rested for a while.

The instinct to get into commercial life was strong, and one day the youth dropped into the stationery and fancy goods store of the veteran merchant, C. B. Routley, of Peterborough, and secured work on Saturdays, much against the wishes of his parents. Then he came to Toronto for a holiday, and obtained a situation with Taylor Bros., founders of the Don Valley Paper mills, and speedily gave up all idea of a course in medicine. He has been in the paper business ever since, and to-day the Ratcliff Paper Co., Ltd., is one of the leading and most widely-known wholesale houses in the Dominion. A removal has just taken place to 44-46 York Street, where five floors afford about 25,000 sq. ft. of space. The old quarters, occupied for so many years by the former firm of Taylor Bros. on Market Street, later by Douglas and Ratcliff, and next by the Ratcliff Paper Co., have been too congested for a long time for their expanding business. They had to store reserve stock in leased premises on Front, Colborne, and other streets, but in their new home will be able to house all their goods under the one roof, and develop many new lines.

Fred. L. Ratcliff, President of the Company, served with the former firm of Taylor Bros. as office boy, collector, and warehouse man. Then he was given full charge of the warehouse. Samuel J. Douglas was the book-keeper, and one day John F. Taylor, head of the concern, took sick, and was away a year-and-a-half. The business was conducted in his absence by Mr. Ratcliff and Mr. Douglas, who ran things with such satisfactory results that the volume of trade even increased during Mr. Taylor's enforced absence.

Having demonstrated that they knew all the details of the work, they concluded that they could manage their own business as well as that of another. They endeavored to buy out Taylor Bros., but an arrangement could not be reached at the time, and so they launched in the paper trade in a small way at 34 Church Street. It was not long after that the old firm changed, and Messrs. Douglas and Ratcliff came back to the old spot. This was in 1899, and the partnership thus formed existed until three years ago, when Mr. Ratcliff acquired the interest of Mr. Douglas, and changed the name of the house to the Ratcliff Paper Co. Ltd. In recognition of their long and faithful service, four employes were given shares in the company, and are to-day associated with Mr. Ratcliff. These gentlemen are J. H. Gain, Vice-President; Norman J. Ratcliff, Secretary; Robert Jennings, and A. S. Grocott. Mr. Douglas is still connected with the house, covering a portion of the extensive territory to which the enterprise caters. On the sales force there are ten men, all well trained and enthusiastic, and among the number is Thomas Barker, who many years ago was a foreman in the first paper-mill established by Taylor Bros., which went out of

commission after their other plants were started in the Don Valley.

The Ratcliff Paper Co. handle all kinds of toilet, tissue, wrapping, news, and other kinds of paper, having the exclusive agency of a number of influential mills, and in addition to these ranges, carry parchment and pergamyn papers, paper bags of all kinds, including flour sacks, glazed and unglazed kraft building papers, butter dishes, pie plates, twine, skewers, etc., etc., in which a solid, and constantly-developing trade has been built up in all parts of the province.

Mr. Ratcliff attributes a great deal of his success in the paper line to the harmony and hearty co-operation of his staff, who are entertained annually at his home, after the annual meeting. Every member of the house works whole-heartedly for its advancement, and the result is a spirit of unity and friendliness, which makes for the upbuilding and expansion of the business.

There are three things which the subject of this reference loves best, next to the paper game. They are bowling, golf, and curling, at all of which he is an adept. Mr. Ratcliff was a member of the Canadian Bowlers team, which toured Great Britain two years ago. He played with the Captain's rink, which won seventeen games, lost thirteen, and tied one. As a member of the Granite Bowling and Curling Club, he takes part every year in the Ontario Lawn Bowling series at Niagara-on-the-Lake, and was a member of the rink which won the first International trophy at Buffalo in 1911. His quartette also captured the Dewar trophy at Ottawa in 1910 at the Eastern Bowling Association gathering. A member of the Lambton Golf Club, Royal Canadian Yacht Club, and other athletic organizations, Mr. Ratcliff has always taken a deep interest in clean, healthy, sports, and finds his recreation on the green and golf links in the good old summer time, and at the curling rink in winter. He also belongs to the Board of Trade, Ontario Club, the Strollers' Club, and York Pioneers, Toronto, and the National Club, Montreal. He has always taken great interest in church work, and for a number of years has been superintendent of the Jarvis Street Sunday School. A member of the National Council of the Y.M.C.A., along with a number of others, he was instrumental in securing for the boys at Valcartier camp a vast amount of stationery, writing materials, etc., which were greatly appreciated by the "Tommies."

CLAY AND FILLERS

A Discussion of the Nature, Requirements, Use and Testing of Two Important Factors in Paper Making.

Thin paper made of fibre alone is more or less transparent. Some fibrous matters are, however, more dense and opaque than others.

In order to overcome the transparency of thin paper such as news, it is necessary to incorporate with the fibre a certain quantity of opaque white material such as clay. Such substances are known as fillers.

Certain kinds of paper are made of fibrous materials, which are more expensive than the filler, and the larger quantity of filler contained in the paper, the less expensive the paper. In other cases the fibre such as ground wood is cheaper than the filler, especially where it is taken into consideration that a large proportion of the filler is not retained in the paper, but is lost.

The strength of any paper is weakened by putting in a filler with the fibre, but the surface, finish, and feel and general characteristics of many grades of paper are much improved by the addition of these fillers.

Hanging paper is much benefitted by the addition of a fibre, and experience has shown that the most satisfactory results are obtained when large proportions of clay are furnished, as for example, 15 to 20 per cent.

Newspaper is also improved by the addition of clay, but as this paper is quite thin and "face," it will not retain anything like as much clay as a thick, slow-stock paper.

The percentage of clay or other fillers capable of being retained by paper, depends upon several conditions, such as the quantity of clay or filler, furnished, the nature of the filler itself, the quantity of alum furnished, also size, the thickness of the paper, the fineness of grinding of the fibre, the proportions of the different fibres furnished, the strength of the suction, the shake, the proportions of rewater used, the "slowness" or "freeness" of the stock, etc.

Sand in Clay. Under the term "sand" are embraced small particles of mineral matter of a hard "gritty" nature of various degrees of fineness.

Ordinarily the sand or grit associated with clay is quartz or almost pure silica, but grains of other minerals other than quartz, may also be associated with the clay, for example, limestone, feldspar, etc.

If a bed of clay comes in contact during its origin with salt water, it is liable to have to a slight extent a "clearing of water" like alum and although this problem has not been solved, it is more or less true, and if any clay floats or water refuses to go into the solution, it is probable that the action of the sea water has produced this.

Coloring in Clay.—Under the term "coloring" in clay are embraced all substances which impart color to clay. The principal substance is iron, the presence of which in different states of oxidation, and in smaller or larger amounts colors clay from a slight yellowish tint to a dark brown. Several colored clays are used as pigments for coloring paper and for making paints, etc. Some clays are also colored by the presence of decomposed organic matter which imparts to the clay a purple or pink tint. Sometimes such tints show outlines of leaves of the elm, elder, cyprus, willow and bay trees, from which they were derived, or present brown colors from the pine or cane leaves. The most ordinary and abundant organic impurity consists of decomposed vegetable matter, which imparts a gray or bluish gray tint to the clay.

Pure Clay. The purest clay in nature is almost pure hydrated silicate of aluminum showing only traces of other substances. Such pure clay is known in mineralogy as kaolin. It has a pure white color.

Almost all of the fillers used in paper making are mineral substances, either in their natural condition or after some process of treatment such as washing, pulverizing, etc. Some artificially prepared substances are used such as blanc-fixee, also some substances produced as by-products in manufacturing operations such as carbonate of lime occurring in the process of causticising soda, sulphate of lime or gypsum, etc.

The filler most largely used is clay, called kaolin and China Clay, which occurs in large quantities in certain localities. Any filler is the more valuable the freer it is from grit or hard sandy particles, and the nearer it approaches to a pure white in color. Some clays are quite yellow in color, especially when wet, although when dry they are nearly white. Some are practically free from grit while others contain large quantities of grit.

Clay or kaolin occurs in large quantities in nature. Clays are of various colors depending upon the nature and the quantities of the impurities associated therewith. Only the whiter kinds of clay are well adapted for white paper although occasionally in colored papers, colored clays may be of considerable value.

What Clay Is.

Clay is a hydrated silicate of aluminum associated with more or less impurities such as iron, lime, magnesia and free silica. Free silica is also called quartz-sand, and is the most objectionable impurity of natural clays. When clay is stirred up with water the particles of actual clay are so fine that they remain suspended or floating in the water for a long time. Any coarse particles or heavy particles like quartz, sand, however, sink rapidly, so that if a thin mixture of clay and water be screened, and then be allowed to settle for a short time the sand or grit settles out almost completely. By filtering the clay and water drawn off from the above sand and grit through filter presses a washed clay is obtained. Some natural clays contain so little sand and grit that for most purposes they are as well adapted for use in paper-making as "washed clay." Other natural clays contain so much free silicate that even by washing and screening through fine silk bolting cloth they are harsh in nature. A pure clay or silicate of aluminum is quite sticky when worked up with water to about the consistency of putty. A silicateous or sandy clay lacks this "stickiness" to a greater or less extent, and no matter how finely it may have been screened, it is "harsh" to the feel and causes much wear on the machine wire and suction boxes. Owing to its lack of stickiness it does not adhere to the fibres so well as the better grades of clay, and there is a large amount of it lost.

Any hard mineral substances may be ground to a very fine powder and bolted so that it appears to be absolutely free from "grit." If such a powder be placed under a powerful microscope, however, it will be found to be made up of grains of sharp edges and corners like broken glass. If placed between the teeth it will feel harsh, and if a brightly polished metal be rubbed with it and then examined it will be seen to be scratched. Clay on the other hand is so fine in texture that the high power of a microscope fails to reveal any crystalline or gritty angular particles. It feels smooth and soapy between the teeth and does not scratch metal surface particles of clay it is also a "sticky" material and attaches itself to fibrous matter more than any other powdered mineral substance. For this reason more of it is retained in the paper and after the paper is finished the clay adheres to the fibrous matter much more strongly than any other filler. There is consequently much less danger of its "flowing off" or "dusting" when the paper is run over the printing press.

The Clay Pits.

As a rule a bed of clay is some distance below the surface, and the soil above is removed. The bed thus exposed is then worked in a very neat and clean manner by cutting drains at the sides and washing the surface clean. In the south the work is done by negroes in bare feet. The clean surface is swept clean with brooms and care is always taken to keep the middle higher than the drains. The clay is removed with picks and is quite damp and tender. The clean damp lumps are placed on shelves in ventilated sheds where the heat and air currents are gradually drying it. It is then packed in casks holding about a ton each.

Some clay beds contain numerous rust streaks and spots and others are free from this. The rusty streaks and spots are of a harder character than the white clay itself and when the clay is stirred up with water these discolored portions do not break down readily into a fine powder, but remain as hard particles resembling burned clay or brick. The quantity of clay at different depths vary in character, and although no difference can be detected in the chemical composition, there is a marked difference in the mechanical behaviour of the clay when treated with water.

The best test for a clay for use as a paper filler, is to drop a few lumps of dry clay into a glass of water, and without stirring observe the behaviour of it. A good clay will emit numerous bubbles with a slight buzzing sound, and as the water penetrates will gradually break down into a fine powder which rolls off from the surface leaving the lumps until finally it is all broken down into a powder. Upon stirring up the mixture with more water, pouring off the fine milk, adding more water, stirring and pouring off very few particles of clay will be left in the glass.

The bottom strata of the bed of clay do not as a rule dissolve or break down as readily as the upper layers.

When such lumps of such bottom clay are treated as above mentioned, instead of slacking to a very fine powder, which rolls off the surface of the lumps, as the water penetrates, it will be observed that the lumps crack into small pieces, then these smaller pieces crack again, and so on when they finally result into a number of coarse lumps with a very little fine powder, so when more water is added, and stirred up, the clay remains in a mealy or lumpy form. It is such clay that gives rise to "clay spots" in paper.

Many such large lumps can be screened out, but considerable waste of clay results, and the finer grains going through the strainer still gives rise to the small spots. The negroes who work the beds can readily tell when a clay is good for use in paper-making by chewing it. If it readily breaks down in the mouth to a smooth cream, it is all right, but if it chews up into little small hard grains, something like corn meal, then it is not a satisfactory clay.

Furnishing Clay to the Beater.

Clay can be furnished in a dry form to a beater, and

if of good quality it dissolves or beats up rapidly, making but few clay spots in the paper. It is much more satisfactory, however, to mix the clay with water in tanks, screen it into storage tanks and furnish it into the beater room by means of pipes.

The thinner liquid it is made into and the longer time it can be stirred the better it will be. There being fewer lumps to screen out, the screening is more rapid and easy, a finer wire cloth can be used to screen it, and it flows better through the pipes. A thin mixture of clay and water of this kind is called "slip."

A convenient strength for "slip" for furnishing to a beater is made by dumping a cask of about 2,400 lbs of clay into a tank holding about 2,400 gallons, partly fill with water, stirring and adding water until the tank is filled.

This gives a "slip," each gallon of which contains 1 lb. of clay. By furnishing 100 gallons of slip, 100 lbs. of clay is furnished, and so on.

The furnish is best measured by means of tanks or boxes above the beaters. Hot water slacks clay more readily than cold water, and it is of considerable advantage to warm up the water, especially in cold weather.

When clay is slacked in small tanks above the beaters and any size is used, it is a good plan to use hot water for slacking the clay, and to dissolve the size in with both.

The alkali of the size causes the clay to slack more readily to a fine slip. Alum retards the slacking of clay and makes it floculate together, thus giving a coarser slip. Alum should, therefore, be furnished separately and not mixed with the clay and water. Alum also acts injuriously upon iron pipes and agitators.

When large quantities of clay are thinned in large tanks for distribution to beaters, size cannot be mixed with it, as it gives use to much foam when stirred and screened, and when water is run into the tank for the next batch.

The Water Content.

Clay contains more or less water both as moisture which can be dried out by spreading the clay out in a dry place or by drying with an oven, and also combined water which cannot be driven off by ordinary drying, but which can be driven off by burning in a kiln like lime.

By driving off the moisture, the clay is not changed in nature and when placed in water will melt and form a "slip" as usual. By driving off the combined water, the clay loses its power to slack and forms a hard mass like a brick or pottery, and then can never be used as a paper filler.

Ordinary clay contains from 10 to 16 per cent of this combined water, and varying amounts of moisture according to the extent that it has been dried out and protected from dampness.

Some clays are quite damp, even to the feel, while others are almost bone dry.

None of the combined water contained in clay is driven off by the heat of the dryers of a paper machine, but practically all of the moisture is driven off, so that the moisture which can be determined by drying the clay in a drying oven is all that a clay loses by drying on a paper machine.

The combined water is held in combination in the clay, just as firmly as the alumina or silica at the temperature of the dryers, and it is a mistake to think that because this happens to be water it is lost, when the paper goes over the machine.

An analysis of a clay states both the percentage of moisture and combined water and the several constituents are figured on the basis of the bone dry clay, so that all clay analyses may be compared on the same basis uninfluenced on the amount of water in them.

A clay analysis would thus be stated as follows:

A sample received contained:

	Per Cent.
Moisture	4.21
Bone dry clay	95.79
	100.00

The bone dry clay contained:

Alumina	40.33
Silica Total	44.75
Combined Water	13.74
Iron Oxide	1.02
Lime	Trace
Magnesia	Trace
Alkali	Not determined

This represents a clay of a good composition. In addition to the analysis of the composition, the percentage of free silica or that not present in combination unit alumina should be shown. It should also state the color as in comparison to a standard color of clay, and the amount of residue left by washing a weighed quantity through a 200 mesh silk bolting cloth, as well as the nature of this residue, whether for example it is either coarse sand, or flakes of mica, a dark or light color, etc.

The analysis should state whether or not the clay slacks well when placed in water, and finally an expression of opinion as to the general quality as regards its fitness as a paper filler.

The Fineness of Clay.

Clay or kaolin is derived from feldspathic rocks by a process of weathering, a chemical alternation, whereby the alkalies of the feldspar are bleached out leaving the hydrous silicate of alumina or kaolin.

Sometimes the kaolin thus formed remains in the same place where the original rock was formed from which it was derived. In such cases the kaolin remains associated with the other minerals, of which the rock was made up and is very gritty with quartz sand of varying degrees of fineness. Such clay is not fit for a paper filler, unless it is washed free from the sand.

In other cases the clay formed from the rock is carried from its original position by flowing waters and deposits in another place. In some cases the current of the water has been regulated by nature so nicely that only the finest clay is carried by it, while all the sand and grit of the finest nature settles out before the clay does.

The water carrying only the finest clay in suspension finally reaches a lake or pond, deposits its clay in the beds in which it is subsequently found in the state of fineness and freedom from grit rivalling the most perfect artificial washing processes.

The grade of clay suitable for use as a filler for "news" is as follows—

Specifications for Clay.

For special purposes such as coating paper a higher grade of clay is necessary, especially as regards color.

Many clays of superior color are colored artificially, that is to say, the natural clay had a yellowish tint which has been neutralized by the addition of some blue color like ultramarine. It is, of course, useless to pay a higher price for such clay as the mill could readily color it themselves.

When, however, one clay is naturally whiter than another, it gives a superior result, as the natural whiteness cannot be successfully matched by artificial coloring. The process of analysis of a sample of clay is rather complicated, and it requires a carefully trained and experienced analytical chemist to perform an accurate analysis of the clay.

The general principles upon which such an analysis depends is as follows:

1st. Getting the entire clay into a soluble form, so that the various constituents may be separated out from this solution, one after the other in forms in which each may be weighed and its percentage calculated. For example:

A small weighed quantity of the clay is dried, weighed again and the percentage of moisture calculated. It is next heated over a blow pipe flame, cooled, weighed again and the percent of combined water driven off calculated.

A small weighed quantity is mixed with sodium carbonate and fused, this makes it all go into solution in water. By making the solution acid and evaporating to dryness the silica is rendered insoluble while all the other constituents remain soluble, when the residue is boiled up with water. This insoluble silica is then filtered off, washed, weighed, and its percent calculated.

By adding ammonia to the filtrate from the silica and boiling all the alumina and iron is precipitated. This is also filtered, washed, weighed. It is then dissolved, and the iron in it is then determined. Clay is then decomposed by treating with a hot mixture of sulphuric and nitric acids, the alumina going into the solution as alum or sulphate of alumina, while the silica and grit are not dissolved.

Alum is sometimes made from clay in this manner, but the mineral bauxite is better than clay for alum making, as it is richer in alumina and contains less silica to be separated.

The silica that was in combination with alumina in the clay and which is separated by treatment is called combined silica and is soluble in soda solution giving silica and pieces of mineral-like quartz, which are not soluble in the soda, thus giving a method of determining how much free silica or grit, a clay contains, as well as how much total silica. This is quite an important test, but is seldom found stated in the analysis of clay.

Sometimes a test is made of the strength of a clay or its binding power as in the case of a cement, but such tests are of value only from a standpoint of the pottery business, and do not concern the paper maker, as no relation has been shown to exist between this feature of clay and the degree to which it is retained in paper. Some other properties of clay are of little or no interest from the standpoint of paper making, such as its shrinkage, plasticity and texture and gravity.

Where Clay Should Be Used.

Soda pulp makes a paper which is less transparent than sulphite and therefore requires less filler. Clay improves finish, makes paper softer and prevents it from drying out so rapidly and getting brittle.

Excessive quantities should not be used as it weakens the paper, causes "dusting" on printing presses and contaminating the ink on the presses. It is also expensive, for when a large amount is used less is retained. Newspaper having too much clay lacks character and the most desirable amount to use is 5 per cent.

But when a mill has good conditions, and ground wood is high, it is cheaper to use much clay and less ground wood, so taking everything into consideration there are times when a maximum amount is good, and other times when a minimum amount is of advantage. In ordinary newspaper about one-half of the clay furnished is retained, but of course, this varies from more to less according to the various conditions.

Size, when used to any extent, helps to retain the clay, but for ordinary news it is better to use no size at all except for certain special orders. Alum affects size, but its excessive use should not be indulged.

It would not be economical to use 2 cents' worth of alum in order to save 1 cent's worth of clay, and it would be borne in mind that alum exerts a hardening effect upon the paper, so that when an excessive amount of alum is used the paper is liable to become hard and dry as well as soon drying out. One barrel of alum to 100 lbs. of paper or 1 per cent, is about the correct amount. More than 1 per cent is not advisable on account of its harmful effects and sometimes less than 1 per cent can be used.

White Water.—The only source of loss in clay is in the white water which runs to waste, and if it were possible to re-use every gallon of white water and have none go to waste, there would be no loss of clay or fibrous material.

Savers.—While it is not possible to re-use every gallon in a paper mill, there are various large differences in different mills as to the amount going to waste, and there is much room for a saving of clay and stock at most mills.

Various appliances have been devised for the saving of clay and fibre from the white water, and are known as "savers" and depend either on the settling out of the clay by gravity or by filtering it through fine wire or felts.

A good settling tank which has been in use for a number of years may be briefly described as a long box with baffle boards in it. The white water flows in it on one side, and the stock settles at the bottom, and the water overflows at the other end. The bottom of the box is provided with depressions into which the thick settlings are scraped by mechanical means. From these depressions the thick stock are pumped to the beaters. The water which overflows and runs to waste contains no clay or fibre, but only a little slime, which is desirable to get rid of.

There is a prejudice among paper makers against the use of white water, they like to use plenty of freshwater, feeling that the use of white water causes slime to accumulate. Some paper makers go so far as to use fresh water exclusively, permitting all the white water to go to waste after passing through some crude

appliance to take out the fibrous material such as a cylinder covered with a fine wire.

Such an appliance takes out only a small part of the material in the white water, and the larger percent goes to waste, also very little clay is taken out.

A large cylinder over which is an endless felt is much more effective than one covered with a fine wire cloth, but a settling box or tank is still more efficient.

The prejudice against white water is unwarranted, and instead of using little as possible of it, some prominent men think as much as possible should be used. There is a large opportunity at nearly every mill to effect considerable saving of clay and fibre, and by careful attention much could be saved.

Testing of Clay.

Moisture. Weigh from one to two grams of the clay in a clip of a watch glass and dry in oven at 120 degrees C., until the weight is constant. The weight lost equals the moisture present in the clay.

Combined Water.—Weigh from one to two gr. of the clay in a crucible and heat over the highest heat in a blast lamp for about fifteen minutes or until the weight is constant. The loss in weight, the per cent of moisture, equals the amount of combined water.

Total Silica.—Weigh 1 gr. of clay in a platinum foil and transfer to a casserole, add 20 cc. of sulphuric acid (1 to 1), 10 cc. of concentrated hydrochloric acid and 5 cc. of concentrated nitric acid. Cover with a watch glass and boil the mixture rapidly in gas plate until fumes of sulphuric anhyrdride are given off. Continue to heat just below the boiling point of sulphuric acid for two hours and add 50 cc. of water. Bring to a boil, and then heat in the steam plate for 30 min. Filter off the separated silica and collect the filtrate in a 200 cc. graduated flask. Ignite the precipitate, while still wet, in a platinum crucible, completing the ignition by blasting for 20 minutes. Cool and weigh. Add a few drops of dilute sulphuric acid and a sufficient quantity of hydrofluoric acid. Heat over a very low flame until the acids are volatilized and then ignite at full heat of burner. Collect and weigh. The loss in weight represents the total silica present in the clay. The residue rarely exceeds five milligrams, and is, therefore, added directly to the weight of the iron and alumina precipitate.

Free Silica.—Weigh 1 gr of the clay in a casserole and then treat in same manner as in the total silica. Filter off the silica and transfer paper and precipitate to a platinum dish. Ignite gently on a Bunsen flame, until the filter paper is entirely consumed, cool, and add 50 cc. of a hot 15 per cent solution of potassium hydroxide. Boil for 6 min. and filter off the free silica, which remains undissolved, washing with hot water slightly acidulated with hydrochloric acid. Ignite, cool and weigh, treat with dilute sulphuric acid and hydrochloric acid and heat over a low flame until all acid is volatilized. Ignite, cool and weigh. The loss in weight represents the free silica in the clay.

Iron and Alumina.—If the residue from the hydrochloric acid treatment of the total silica which is so small as to render fusion with acid potassium sulphate unnecessary, then cool the filtrate from the total silica, dilute to mark and shake well. Draw with a pipette 50 cc. of this solution, transfer to a 200 cc. beaker and add about 5 cc. concentrated hydrochloric acid and a few drops of nitric acid. Heat to a boiling and add dilute ammonia until a slight excess is present, continue to boil until the odor of ammonia is only slightly perceptible. After standing a short time, filter off the precipitate by means of suction. Wash with hot water, dry the precipitate and ignite in platinum crucible. Finish the ignition by blasting for about 30 minutes, cool and weigh as Al_2O_3 plus Fe_2O_3.

Iron.—Evaporate the filtrate from the silica, used in the determination of free silica, to about 100 cc., reduce the iron in the usual manner by means of a Jones Reducer, and filtrate with standard potassium permanganate. Express result as Fe_2O_3.

Alumina. Subtract the percentage of iron from that of the iron alumina combined. The result represents the percentage of Al_2O_3.

Calcium Oxide.—In 100 cc. of the filtrate from the total silica, precipitate the iron acid and alumina with ammonia, filter and wash well. Heat the filtrate to boiling and precipitate the lime as calcium oxalite by the addition of a hot solution of ammonium oxalate. Filter off the precipitate, ignite to constant weight, cool, and weigh as CaO.

Magnesium Oxide.—Add a slight excess of hydrochloric acid to the calcium oxalate filtrate, evaporate to about 100 cc. Add an excess of sodium ammonium phosphate, stir until dissolved and add concentrated ammonia drop by drop with constant stirring until a considerable excess is present. Cool in ice water for about two hours, filter and wash the precipitate with ammonia wash water. Place the moist precipitate in a platinum crucible, and carefully smoke off the filter paper. Finish the ignition over a hot blast, cool and weigh as $Mg_2P_2O_7$. Calculate to MgO.

Notes and Precautions.—In the majority of cases the acid treatment of the clay gives as complete a decomposition as the sodium carbonate fusion, and the residue left from the hydrofluoric acid treatment of the silica, should not amount to more than five milligrams. In case this residue is excessively large, it then becomes necessary to fuse the residue with a small amount of acid potassium sulphate. This fusion is dissolved in hot water, and solution then added to the 200 cc. flask, containing the filtrate from the total silica, which is then diluted to the mark.

THE DETECTION OF LOSSES BY FORMULATING A BALANCE.

(Continued from page 413.)

not be accurately translated into terms of weight.* It is lamentable that the principal raw material of a pulp mill should be purchased on such an unsatisfactory basis. Losses exist in sawing to two foot lengths, in barking, chipping, conveying, cooking, washing and lastly in the white water since some fibre, though perhaps too short to be of value, always goes into the sewer. In like manner a sulphur balance and a lime balance may be made, carrying the constituent through the process from the burner or the slacker to the digester waste liquor. A heat balance on the digesters is also possible, and furnishes very valuable data. A chlorine balance on the bleach plant is one of the best and less difficult to perform.

In the paper mill the balance may be run on stock, alum, rosin, soda ash, filler or any constituent entering and leaving the process.

In conclusion it is well to state again that the carrying through of a balance is no small task to be finished in a day, but the results, showing up as they do the losses in position and magnitude, must more than repay the labor and expense of the work.

*Pulp and Paper Magazine of Canada; 7 15 14.—M. L. Griffin.

UNITED STATES NOTES

The Tolland Leather Board Company has filed a certificate of organization at Norwich, Conn., with a capital of $15,000. The officers are President, Max Zucher, Brooklyn, N.Y., and secretary, David Mauel, Willimantic. This is the company which will succeed the American Board Company, of Hop River, Conn., whose plant was recently burned and which the new company has rebuilt.

* * *

The creditors committee of the Babcock Paper Manufacturing Company, Otsego, Mich., have tentatively accepted a proposition of S. B. Monroe for the taking over of the mill at Otsego. The proposition made to the creditors committee contemplates the payment of fifty cents on the dollar, and the terms of payment will be settled when 90 per cent of the creditors have signified their willingness to accept the settlement.

* * *

P. J. Kennedy, Inc., of Holyoke, Mass., has been awarded the contract for the construction of the Paper Makers' Chemical Company, which has leased the old plant of the Highland Manufacturing Co., on Main Street, that city, for a term of ten years. It will cost about $20,000 to complete the improvements and remodel the plant. The installation of the machinery is under way and the plant will be in operation early in the autumn. The plant will be a branch of the firm which has headquarters in Easton, Pa., and another factory at Kalamazoo, Mich.

* * *

The Peerless Paper Products Company of Menasha, Wis., manufacturing toilet paper and paper towels, has secured the services of M. C. Dalton, who has been associated for the past twenty years as superintendent with the leading tissue mills of the East. Mr. Dalton will have complete charge of the new plant as superintendent with P. W. Drysdale, formerly general manager of the Patten Paper Company, of Appleton, Wis.

* * *

Extensive improvements are in progress at the plant of the Union Bag and Paper Company at Kaukauna. The paper machine will be enlarged and rebuilt, and a new Fourdrinier is to be installed. A new water wheel is to be built, and a new screen will be installed as will also a variable Reeves driving machine to do away with the old style cone pulleys and the step pulleys.

* * *

Frank L. Moore, president of the American Paper and Pulp Association, in an interview last week with your correspondent, said that as a general thing the paper business seems to be picking up a little all over the country. On account of the office he holds. Mr. Moore is in close touch with all parts of the trade, and receives weekly reports from all sources.

The New England agency of the American Straw Board Company, manager, formerly located at 15 Milton Place, Boston, has removed to a handsome suite in the United Building, 185 Devonshire Street, that city.

* * *

D. L. Koontz has recently perfected a method of making a line of sanitary paper packages for food products. He has temporary quarters in a portion of the Fort Atkinson Canning Company's plant at Fort Atkinson, Wis. One of his products, a patent container for ice cream or meats is meeting with general favor. Because of the demand for sanitary paper containers he is confident of doing a good business.

* * *

Taking advantage of the big increase in the water power in the Hudson River, the International Paper Company and the Finch-Pruyn Company are operating their pulp departments at Glens Falls, N.Y., to full capacity. The pulp mill of the latter company, which has been virtually closed down since spring, is now giving employment to 150 extra hands. The Finch-Pruyn Company is working additional hands in an attempt to make up to some extent the inroads made in the reserve pulp supply during the time the pulp mill was down.

* * *

The Hurlbut mill of the American Writing Paper Company at South Lee, Mass., has been shut down for an indefinite period to give opportunity for repairs. A new and more powerful water wheel is to be put in place of one of the wheels and many minor repairs are to be made, which will amount to something like $15,000.

* * *

The Forest Service is sending out its usual annual warning to beware of forest fires now that the season is commencing. Last year it is estimated that approximately 6,000,000 acres were burned over with a total loss of $9,500,000. In a majority of cases the fires were preventable.

* * *

Developments towards reaching an early agreement for the reorganization of the financial affairs of the American Writing Paper Company were few during the past fortnight. Nothing of any importance transpired and the only document made public during this time was in the form of a circular letter, which came from the bondholders' protective committee, and which were distributed among the bond owners. The letter explained the recent change in the personnel of the "bondholders' protective committee" and the so-called "Ogden" committee, which was named to suggest plans for the reorganization.

PULP AND PAPER NEWS

In June, 1912, Lwan Lucyzeki, an employe of the Spanish River Pulp and Paper Mills Co., at Espanola, Ont., was killed in the company's mills on a revolving shaft and suit was recently brought, on behalf of his widow and child, claiming five thousand dollars damage. At Osgoode Hall, Toronto, before G. S. Holmestead, acting Master-in-Chambers, the action was dismissed on the ground that the plaintiff was an alien enemy of the King and the plaintiff, Mrs. Anna Lucyzeki, is not a subject of the British Empire, being an Austrian. In dismissing the action, however, the acting Master said that he did so without prejudice to another suit, which might be entered at the conclusion of the war.

The Northern Navigation Co. have decided to issue a daily paper on their three large steamers which ply on the inland lakes between Sarnia and Duluth. The name of the publication is the "Northern Navigator," and the introduction of a daily, similar to that printed on the ocean liners, is an innovation so far as water transportation in Canada is concerned.

The lumber mills of the Gordon Lumber Co. at Cache Bay, Ont., were destroyed by fire recently, the loss amounting to $150,000 of which $75,000 was covered by insurance. Luckily, the wind was blowing from the north or otherwise the yards, which contained some ten million feet of white pine, Norway pine and spruce, would have been wiped out also. The capacity of the mill was 200,000 feet a day. The owner is Senator George Gordon.

The plant of the Canadian Pulp and Lumber Co., located at Latchford, Ont., was destroyed by fire recently with a loss of ten thousand dollars. A large number of men are thrown out of employment. The residence of the manager, the office, and one or two other small buildings were saved.

Fred Lancaster, of Halifax, who is the Maritime representative of the Canada Paper Co., is spending his holidays in Montreal and other cities.

William Gregor, formerly superintendent for Price Bros. and Co., who is now engaged in special work in connection with the equipment and operation of pulp and paper mills, and has been for some time among plants in Wisconsin, is spending a few days at his home in Westmount.

The Wilkins Smallware Co., 28 West Market Street, Toronto, have taken the premises formerly occupied by the Ratcliff Paper Co., at 30 West Market Street, the latter concern now being in their well equipped and commodious new quarters at 48-50 York Street, Toronto.

The Guelph Herald, Ltd., has been incorporated with a capital stock of $125,000 with headquarters in Guelph, and to engage in a general newspaper, printing and publishing business. Among the incorporators are Harry Gummer and Bertram G. Gummer.

The capital of Church Life, Toronto, has been increased from $5,000 to $40,000.

The Rathbun Match Co., Ltd., who have a federal charter, has, under the licensing of extra provincial corporations, been authorized to do business in Ontario and to expend a sum not greater than forty thousand dollars. The headquarters of the company are at Deseronto.

Supplementary letters patent have been granted to the Toronto Type Foundry Co., Ltd., to manufacture and deal in shells, cartridges, bombs and other projectiles. The company recently announced, in newspaper advertisements, that they have one of the largest machine shops in Canada located in Toronto, and were fully equipped for the making of munitions of war and open to receive contracts for several hundred thousand shells, high explosives, from English, French and Russian Government agents. One of their machine shops is 100 x 300 feet in dimensions.

A charter has been granted to the Garden River Timber Co., Ltd., with head offices in Toronto, and a capital stock of fifty thousand dollars. Among the powers of the new company are to carry on the business of lumbering in all its branches, to manufacture pulp and paper, and to make and deal in logs, timber, pulpwood, shingles, etc.

The death of Aubrey White, Deputy Minister of Lands and Forests for Ontario, which took place at his summer home, Chief Island, Lake Muskoka, removes from official life a man, who was universally beloved by the pulp and timber operators of the province with whom he had a great deal to do during the thirty-five years that he was connected with the department. His whole life was energetically devoted to the duties of his office, and of his work and worth it is not necessary to refer. Thomas W. Gibson, Deputy Minister of Mines, is acting Deputy Minister of Lands and Forests until a successor to Mr. White is appointed.

By the opening of the new direct railway line from Toronto to Winnipeg, via the G.T.R., the T. and N. O. and the Transcontinental, a large section of valuable land has been tapped. The tri weekly train service, which has been installed, will from present appearance prove very successful. The distance from Toronto to Winnipeg, by the new route, is 1,257 miles, which is made in forty two hours, through a country west of Cochrane, very rich in pulp wood. The work of clearing the land, it is estimated, should more than pay for itself in pulp wood. The opening of the through line brings seven thousand five hundred square miles of the most fertile district in Canada, covered with spruce and balsam, into the arena of available assets of the Dominion.

A number of contracts for supplying pulp wood along the line of the T. and N. O. railway have recently been awarded, particularly along the Elk line branch. McCrea and Sharp, Ltd., of Sudbury, Ont., have a contract for furnishing several thousand cords of pulpwood, part of which has been sub-let to settlers. The company have three rossing machines at work.

The Markets

CANADIAN MARKETS

There is not much interesting to record in the market conditions during the summer months when newspaper advertising is rather low and job printing offices are for the most part running on short time. The newsprint mills are busier than they would otherwise have been, had it not been for the strike in several of the plants in Northern New York and the sympathetic strike at Donnacona, which has resumed operations however and is now running to full capacity.

The exporting mills are all pretty active, and, during the past few days, there have been some interesting rumors in that better selling arrangements would be made for foreign business and thus prevent price cutting when any new proposition comes on the market. Negotiations to this effect are well under way but whether they will materialize is not yet known. The union of interests is for the purpose of arriving at a better understanding and guarding against the price of news print sagging where it was about six months ago when some mills were offering their product at a figure that it would be a shame to relate. Matters have since considerably improved owing to a clearer understanding. As news print is a staple commodity, less open to fluctuations perhaps than anything else in the pulp and paper world, due to the steady demand, there is no reason, in the opinion of the larger operators, why its value should not be more permanently adjusted and this can be brought about by concerted and more harmonious selling arrangements. It is said that the exporting mills of Canada will be divided into two groups, the eastern and western and all the product will be taken care of through these mediums.

Three-fourths of the newsprint produced in the Dominion is exported and the daily production, when the Abitibi Power and Paper Company's huge plant gets under way, will be about two thousand tons per day. It is rumored that the Chicago Tribune is using fifty tons per day more than the Ontario Paper Co. at Thorold, Ont., is producing and there is a report that another machine will be installed but so far nothing definite has been decided. Prices for news print keep up well.

The book and writing mills are not busy and will be operating to about seventy five to eighty five per cent of capacity until the quiet months of the summer are over. In other lines of paper, things are naturally quiet and buying is spasmodic. Several paper houses are backing up the "Made-in-Canada" propaganda with another slogan "Buy it Now," which is having a good effect in some quarters by stimulating a moderate amount of business among those who are inclined to hold back.

The sulphite situation is getting stronger owing to stocks being cleaned up and prices are firm. In the line of [illegible] there are [illegible] below normal and shipments through the [illegible] are lacking both in volume and number due to the scarcity of ships. All the big mills are buying closely. The demand for ground wood is fair and there are the usual number of inquiries but nothing of special interest has cropped up. In the rag and paper stock branches, conditions are quiet and there is little liklihood of a change for some time. Certain lines are very weak but roofing stock is quite firm. It may be added that coating paper plants are doing fairly well and mills making specialties report good business, while the demand for kraft keeps up suprisingly well and the outlook is promising.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.90 at mill, in carload lots.
News (sheets), $2.00 to $2.10 at mill, in carload lots.
Book papers (ton lots), 4.25 c. up
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.35 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.10 to $3.50.
Unglazed Kraft, $3.50 to $4.50.
Glazed Kraft, $4.50 to $5.50.

Pulp.

Ground wood pulp (at mill), $15.
Ground wood $19 to $22, delivered.
Sulphite (unbleached), $38 to $43 del. in Canada.
Sulphite (unbleached), $38 to $44, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. I hard shavings, $2.10.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 40c.
White blanks, $1.00.
No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.55
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Folded News, 32½c.
Over issues, 40c.
No. 1 cleaned mixed paper, 22½c.
Old white cotton, $1.75.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.20.
Black linings, $1.25.
New light flannelettes, $3.75.
Ordinary satinets 90c.
Flock, $1.00
Tailor rags, 75c.

Blue overall cuttings, 3.37½.
Manila rope, 2½.
No. 1 burlap bagging, $1.00.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5½c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground wood, $20 to $23, delivered in United States. States.

NEW YORK MARKET REVIEW.

Special to Pulp and Paper Magazine.

New York, July 25, 1915.—Judging from the seller's point of view, the prospects for the ground wood pulp market are much more encouraging than they have been for some time. Water conditions are still such as to allow paper mills to grind their own pulp, but they are now doing so with greater difficulty and with a likelihood that they will not be able to meet their own requirements. Grinders report a fairly brisk inquiry. While they do not yet speak of improved business, they are confident that before the month is over, a material change will be noted in the general volume. Some paper mills are even now working on their reserved stocks, which fact seems to bid fair for an early resumption of àctivities in ground wood.

The chemical pulp situation seems to grow more precarious as time passes. That the market is firmer and that the tendency is to advance is manifest throughout all of the accounts of the [illegible]. Up to a short time ago reports were frequent of shading of prices in various grades but at the present time it is understood that there are almost no concessions being made. While great relief was felt after the cable was received from Norway declaring that the labor troubles had been avoided, the strengthening of conditions was not in the least [illegible] by this report. Domestic paper mills are laboring under the delusion that the foreign ports are well filled with chemical pulp of all kinds. The newspaper accounts of the sinking of Scandinavian vessels in the Baltic Sea seems to have left an impression that there is comparatively little trading being carried on between the Scandinavians and Great Britain. With this conception in mind, a number of consumers in this country have been slow to realize the exact situation and still insist upon trying to bargain for stock. However, reports which are to all appearances authentic, coming from Scandinavian representatives of local importers states that there is comparatively little pulp to be had for immediate shipment. England has been sorely in need of chemical pulp and is said to be buying up large shares of the Scandinavian production at very high prices. France, too is eager to fulfill her needs and is competing with England for chemical pulp. Aside from this, the foreign mills continue in their complaints of the higher cost of manufacture. The recent coal strike in Wales made it almost impossible to secure coal. The fact was that unless a new source of supply for coal was not found immediately, it was possible that several mills would have been compelled to shut down. The United States have been regarded as a probable factor in future shipments of coal; however it is somewhat uncertain as to just how far the Scandinavian mills will be able to negotiate for American coal. The freights from this country are so high as to almost eliminate such a proposition from consideration. Sulphur, too, is wanting. The embargo on Sicilian brimstone has compelled foreign mills to look to Japan and the United States for stocks. Krafts have assumed somewhat of a little healthier aspect recently and are in slightly better demand. Both unbleached and bleached sulphite are reported to be more active and prospects are considered fairly encouraging.

Bagging continues in fair demand and is selling at good prices. Gunny is brisk at $1.80 to $1.85. The tone of Manila rope is decidedly healthy at $2.75 and $3.00 with a tendency to advance. There was a stir in the market during the week when a report was received that an embargo had been placed on jute. However, later confirmations specified that this action affected only the ports of Great Britain while India is still free to send her supplies to domestic importers. As the facilities for shipping are very poor, future imports are looked upon as somewhat of an unknown quantity. Rags have shown no improvement since our last review of this market. Conditions are approximately the same in almost every respect. The demands for stock seems to be about nil and dealers are forced to resort to every possible means in order to rid themselves of an accumulation. Thus far the collections of rags have been very small, owing to the unusually low prices which are being paid for stock. However, it is predicted that the next few months will find rags gathered in much greater quantities than heretofore. Whether this will affect the market or not remains to be seen. The last few weeks have witnessed a decided falling off in the importations of foreign rags. France and

England are not eager to export any goods of this kind and it appears as if we will not be able to expect very much from this direction for some time. The inactivity of the writing paper mills continues, thus offering little hope for this market at the present time.

Waste papers are dull and weak. Prices have not changed materially nor has there been any real improvement in the volume of business. Hard white shavings are plentiful at $2.25 while soft shavings can be obtained at as low as 45c. Over issues are going at about 50c. Strictly folded news is quoted at 30c to 35c. No. 1 mixed papers have shown slight betterment and are going at 20c to 22c. Common mixed papers are being sold at 12½c.

The general outlook of the local paper market remains about the same. Mills are not increasing their output noticeably but rather attempt to curb, in so far as it is possible, their production. Jobbers, complaining of poor business, lay stress on the fact that the usual summer dullness is now being felt. However, it appears that circumstances other than the summer season are affecting the market. If export facilities were sufficient, there is no doubt that considerable quantities of paper would be sent out from this country and thus relieve the situation which has been caused by a lack of demand for goods. Rumors are in circulation that many large foreign orders are being held by various firms in this city, who find it impossible to fill them owing to an inabilty to secure bottoms. France has entirely removed her duty on newsprint and is inviting almost every source of supply to ship goods to her ports. At the present time, there is little doubt that if it were possible to send goods to France, large stocks of news print would be exported from New York. As it is, this market has strengthened a great deal. The strike at Watertown, while it has been slightly relieved by strike-breakers, has served to make prices firmer and to make prospects brighter. It is undoubted that a large tonnage has been removed from the newsprint market. This can readily be judged from the stand which is now being taken by manufacturers in general. No reports of shading of prices has been received. In fact mill men are inclined to believe that an advance is due early in the fall. Long term contracts are, however, practically impossible just now. Side runs are more firm, due to the labor situation in the Black River district. Quotations on these goods have been withdrawn by most firms and higher prices are said to be prevailing. One sale was reported consummated at $2.05 f. o. b. mill. Side runs are scarce and it is very likely that they will advance considerably in the near future. The tissue market has shown a tendency to strengthen in the past few weeks. Thus far there has been no improvement in the volume of business, nor has there been any inclination on the part of jobbers to buy any more stock. It appears that they have bought quantities during the recent break in prices. However, it seems inevitable, should sulphite continue as it has been continuing for the past month or more that tissues will show a decided change. Sulphite is an important factor in the manufacture of No. 1 White, and any advance in the pulp must affect the cost of the manufacture of paper. No. 1 White is rather dull at present, and sales are still being reported at 3¾c. Manilla tissues are fairly active; colors are, of course, very firm. Deep tints are practically out of reach of the buyer. Toilet papers are brisk; crepe papers are seasonably active and are commanding fair prices. Manilas are in poor demand. Considerable shading is reported in this market. Fibres also are lifeless and are being quoted at far below normal quotations. Krafts are weak and featureless. Boards continue to be somewhat of a drug on the market. Paper bags are holding firm at the new prices, although the volume of business is sadly lacking. Book papers are not in demand. Reports are frequent of considerable slashing of prices in this market.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine.)

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., $1.80 to $2.00, delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.60 to 2.90, ex dock, N.Y.
Easy Bleaching, impt., 2.10 to 2.25c, ex dock, N.Y.
Easy Bleaching Pulp from 2.15c to 2.20 to 2.10c to 2.25c.
Unbleached sulphate, impt. 1.80c to 2c, ex dock, N.Y.
Bleached sulphate, impt., 2.75c to 2.85c, ex dock, N.Y.
Kraft Pulp, $1.85 to $1.95

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

The Thorold Pulp Co., Thorold, Ont., which have now been running over a month, report business as good and most of their output as sold for the coming year. The company have a large yard of spruce wood at Thorold, and another at Burke's Falls, Ont. The new mill is erected entirely of concrete, stone and steel, with tile roof, being 60 x 40 feet, two storeys high. It is equipped with two New England grinders, and two 84-inch wet machines, with three centrifugal screens. The plant has rope drive transmission and is equipped with 1,000 h.p. water power from five water wheels. The capacity is twenty tons per day of fine ground wood pulp.

Ottawa Notes

Ottawa, Ont., July 25.—A matter of great importance to pulp and paper interests is to come before the International Joint Commission at a series of hearings to be held early in September, the levels of the Lake of the Woods and its tributary waters. Testimony will first be taken at Warroad, Minnesota and later at International Falls and Kenora, Ont. What makes the problem of importance to the paper industry is the fact that the Minnesota and Ontario Power Company, one of the largest paper mills in the world, is established at International Falls while many million dollars have been invested in power development on Rainy river, at the outlet of the Lake of the Woods and on the Winnipeg River.

The problem which the Commission has to solve is to recommend to the two governments the establishments of such levels or ranges of levels on the Lake of the Woods as will best serve the interests of all concerned on both sides of the boundary, power interests, pulp interests, transportation, fishing, lumbering and other interests.

It is probable that the night shift at the J. R. Booth sawmills will be shut down in the near future as the company cannot do any shipping, and that this example will be followed by the McLachlin Brothers' mill at Arnprior. The pulp and paper end of the Booth industry, however, will be operated at full capacity as far as present intentions go.

The movement of wholesale pulp and paper prices during the past year is shown in the annual report just issued by the Department of Labor on Canadian Wholesale Prices, 1914. It shows the following change of prices

Pulp and paper.—The markets were somewhat easier in the early part of the year, but became very firm in August as a result of increased demand from newspapers during war and because supplies of materials, especially sulphite, from Europe were interrupted or increased in cost. Dry weather and low water in the summer also became a factor in the higher prices. Toward the end of the year the market eased off considerably.

Newsprint paper was down in price to $1.95-$2 in the spring, in June fell to $1.90-$2. By Oct. 1 the price had risen to $2-$2.10, but eased off in December when the market was still weak. The consumption in the United States was estimated 30 per cent greater than last year.

Wrapping paper declined from $3.25-$4 to $3-$3.75 in February. In April the price was firm, but fell back again and rose in July. In September the price was up to $3.35-$4.10. The average price for the year was $3.60 as compared with $3.65 in 1913. The demand was reported very light at the early part of the year and considerable price cutting was reported.

Pulp, ground wood, declined from $15-$16 to $15-$15.50 in April, but advanced in June on account of low water in United States. Papermakers in United States, therefore, bought Canadian pulp instead of pulp wood. In September the price advanced still further, reaching $16-$18 in October on account of the great demand for news print. In December the price was up to $17-$18. Sulphite pulp was very firm at the first of the year, but eased off $2 in February, falling to $56-$58. In June the price advanced $1. Stocks were very low and increased demand was reported in the United States. In September the price was up to $58-$59 as shipments from Norway and Sweden were interrupted and more expensive. In December the price was down to $46-$47 as supplies were accumulating. The average price for unbleached sulphite was $44.37 as compared with $45.42 in 1913.

The newly appointed hospital commission, on which Sir Rodolphe Forget represents the pulp and paper trade and Mr. F. W. Avery of Ottawa the lumber trade, has organized and held its first meeting in Ottawa. The Commission announces that a number of private residences (one of which was previously made by Sir Rodolphe Forget himself) cannot yet be accepted until it is known how large will be the number of invalided soldiers returning.—Mac.

TENDERS FOR PULPWOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway west of Lac Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council, for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near that territory, and to manufacture the wood into paper in the Province of Ontario — the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,

Minister of Lands, Forests and Mines, Toronto, June 5th, 1915.

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One Year of War

That which all the world hoped and prayed would not occur, has come to pass. We have reached the end of one year without any end to the hostilities which have been ravaging and racking Europe, and plunging the whole globe into a chaos the like of which history has never recorded. Instead of being free to go back to the employments of peace, millions of men are still sleeping within gunshot of one another, and in constant danger of destruction.

The recent suggestions, believed to have emanated from Germany, that peace may be arranged speedily by the Vatican, are a sad mockery. No one among the Allies entertains for a minute the idea of treating with the enemy, and Germany, flushed with recent successes in the Eastern theatre of the fray, will probably be deaf to any efforts of Rome, even if they should be put forth.

Gradually the world outside of the nations in the Alliance are coming to see that German militarism must be crushed. Some of the smaller nations are wobbling, but only because they are fearful of the immediate future. Few doubt that in the long run the war lords must be decisively beaten.

History may show that the Kaiser's plea that the "sword was forced into my hand," was not far wrong, the only point as yet unexplained being that the fight was fomented in order to save the prestige of the Prussian war party.

However that may be, the fact that a year has passed, during which Britain and Russia have "muddled through," Belgium proven herself a martyr, France been really rejuvenated, though at inestimable cost, and Italy brought to the side of liberty and democracy, merely makes more stern the determination of all loyal British subjects to turn heart and hand to the great work that must still be accomplished.

It is given to some of us to fight the fight of the soldier, and to others to keep the wheels turning, and the haversack of the hero full. Wherever our lot is cast, we shall need redoubled courage before the second year of the struggle has passed.

Ontario Safety Association Active

The Ontario Pulp and Paper Makers' Safety Association has begun its useful activities. Following upon a very wise move in choosing as Secretary a gentleman of the capacities and experience of Mr. Hugh D. Scully, the directors have decided to engage a man expert in matters of safeguarding in industrial plants. This safety engineer, it is understood, will go over the ground rapidly, to determine in a general way what measures should be adopted to make the work of the Association thoroughly effective.

Experience in many lines has gone to show that a permanent inspector is a necessity to any safety organization. It is therefore expected that one of the first recommendations of the expert who will make the tour of the Ontario mills will be the appointment of such a man.

That much patient study and careful deliberation await all who are connected with the new move, goes without saying. Men who have the practical experience and the scientific training which fit them for safety work are very few in number. Between hundreds of men who have the common everyday sense of danger, and the master mind in such affairs, there is an immense gulf. The really good safety engineer has above all else to be a student of human nature, even to the degree which will tell him what dangers a worker will run in the sober unconsciousness of everyday employment, let alone in many foolish efforts to minimize labor or to play with companions. To cover a steam pipe so that a man who unconsciously takes hold of it to avoid a fall will not let go, may appear an unusual precaution, yet it has been found necessary in certain instances. The psychology of the worker in such a case affords a very nice and delicate study for the safety expert. But to command the attention of men to such an extent as to prevent their "fooling" with one another(scuffling and horse-play have been shown to be most prolific sources of injury) is something far beyond the capabilities of most individuals.

Recent statistics are to hand to show that in paper mills the number of accidents has been reduced in a period of six months by 83 per cent, and the lost time due to accidents by 95 per cent. This will afford much hope to the Ontario men in the Safety Association. Papermakers have had it urged upon them upon numerous occasions by prominent members of the industry, that the policy of the Ontario Workmen's Compensation Board in placing responsibility for accidents primarily upon employers, has really opened up a great opportunity to those affected. Responsibility is placed upon the workman as well, and careless men will not only be eliminated by accidents which, according to statistics, are due to overtake them sooner or later, but greater skill and thoughtfulness will be developed among employees.

When the Safety Association is in full swing it will be seen that losses will be reduced and general conditions in mills vastly improved.

Newspapers Doing Well

Statistics compiled by a prominent newspaper directory show that on the whole the war has not seriously affected the newspapers of Canada. It is true that fewer publications were begun in the past year than in the year previous, and also many periodicals have suspended publication, but at the same time many of the large city dailies have materially increased their circulation. The census shows that there is one daily to every 10,000 families, and one weekly for every 1,500 families in the Dominion.

These signs of a thriving journalistic world will be received with gladness by the paper mills of the country. While book and writing manufacturers have been hit principally by the curtailment of enterprises, other than publications, which demand their goods, and while the news mills have larger interests across the line than in Canada, the buoyancy of our publishing houses is much to be admired. Many are keeping up with the greatest difficulty. The demand for high priced cable news from the seat of war undoubtedly makes circulation large, but it also makes newspapers poor. In the cities, where competition is keenest, this is noticed most.

Surely, if slowly, Canada is making progress over the stormy industrial seas, and there should be a continued improvement which will give to Canadian periodicals the business to which paper manufacturers look forward so earnestly.

Who Invented Groundwood Pulp ?

A contributor to our New York contemporary "Paper Trade Journal," makes some statements which will be of interest to those Canadians and others who have followed the claims published in "Pulp and Paper Magazine," that Charles Fenerty of Halifax, invented groundwood pulp. The credit of invention should go, according to Albert Komp, the writer of the article in question, to a German. Says Mr. Komp:—

"Jakob Christian Schaeffer, doctor of divinity and evangelical preacher in Ratisbon, prof. hon. at Altona, Germany, produced paper from wood and other natural substances during the years 1760 to 1772. Schaeffer has stated that Reaumur, Seba and others had observed that the wasp constructs its nest from wood fibres, and these savans, finding the composition of these cells so much like paper and cardboard, perceived that the qualification of wood presents a useful material for making paper. Regarding Schaeffer's experiments and results, he disclosed the same disinterestedly in two editions, the first in 1765 to 1771, the second in 1772, under the title of "Versuche and Muster Papier Zu Machen" (Trials in Making Paper and Samples). Well preserved copies of said work, including samples of paper made by Schaeffer, have been accessible to investigation up to the present time."

If this claim should prove to be well based, the knowledge would be received everywhere by people of a scientific and historical bent with all credit to Mr. Komp. It will at least throw some light on this interesting problem.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

Pte. CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action Feb. 28th, 1915.
Pte. WM. SMITH.
Pte. WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
Pte. GEO. ALBERT BROWN.
Pte. C. V. PERRY.
Sergt.-Major E. C. MORRIS.

Bird & Son.

JAMES BOATH
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GLIDDEN CAMPBELL.

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford & Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.

Kinleith Paper Company, Limited.

CAPT. C. STEWART-PATTERSON.
GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

The Laurentide Company, Limited.

M. JEAN ARHAN.
M. FRANCOIS DURCHER.

Price Bros. & Co., Limited.

G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. A. MOAT.
J. C. EAGLES.

H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. BERNIER.
A. AMY, Jr., killed 31st May.
E. LEDGER.
J. HOOD.
S. HARTLEY.
G. LANE.
R. DONCET.
C. CONLEY.
S. LAPIERRE.

St. Croix Lumber Co.

FRED BOUCHY.
CLIFFORD WHEADON.
BERT McMULLEN.

St. George Pulp and Paper Company.

HARRY HEWITT.
GORDON GRAY.
ROBERT GRAY, Jr.
ARTHUR HATT.

Spanish River Pulp and Paper Mills, Limited.

L. FINCH.
W. P. L. FOOT.
OLIVER DENMAN.
M. L. COTGRAVE.
E. COLLINS.
C. MARTIN.
HOWARD N. REID.
P. VENN.
GEO. WICKENDEN.
HAROLD LOCKWOOD.

Toronto Paper Manufacturing Co., Ltd.

ALLEN FORBES.
JOHN GIRARD.
MIKE COLBORNE.
Z. MARTIN.

The E. B. Eddy Company, Limited.

F. T. SEAR.
A. F. CLARKE.
WILLIE SMITH.
EDWARD LONGPRE.
ALPH. FOURNIER.
A. BRANCHAND.
EDWARD PERRY.
J. C. FARISH OWEN.
THOMAS OUELLETTE.
LEANDRE CHEVRIER.
E. S. HUBBELL.
JOSEPH DESORMEAUX.
THOMAS ALBERT KELLY.
J. E. FRASER.
CHAS. COVELL.
EDWARD COLLINS.
ISODORE GAUDREAU.
OVILA FOURNIER.
GEORGE MORRISON.
WILLIAM CRAIG.
W. S. GOODEVE.
HARRY FRANCIS.
HERBERT LOVE.
JOHN MOORE.
JEAN DESJARDINS.

MacLeod Pulp Company, Limited, Liverpool, N.S.

Sergt. R. D. BROWN, 1st Clearing Hospital.
Pte. SAMUEL MANTHORN.
Pte. FARQUHAR McRAE.

Howard Smith Paper Mills, Limited, Montreal.

J. KEELY, 60th aBttalion, Calcartier.

Northumberland Pulp Co. Limited, Campbellford, Ont.

EVERET SWEET, honorably discharged.
ARTHUR LLOYD.

National Paper Company, Limited, Montreal.

JOHN NEIL, Jr., 24th Battalion, Shorncliff, England.
WILLIAM ROBERTSON, 60th Battalion, Valcartier.

Barber Paper and Coating Mills Limited, Georgetown, Ont.

A. B. C. HERBERT.
THOS. THEO NELLE.
HERMAN NELLE.
HENRY W. FRANCIS.
JOHN PEACE.
FRED McCARTNEY.

Lincoln Paper Mills Company, Limited, Merritton, Ont.

PERRY RICHARDSON.
HENRY HOOKINGS.
LAWRENCE BRADLEY.
LOUS O'NEILL.
ERNEST WATSON.

Wayagamack Pulp and Paper Company, Limited, Three Rivers, Que.

R. A. GILLIS, 3rd University Co., McGill Battalion, C. E. F.

Ritchie & Ramsay, Limited, Toronto, Ont.

JAS. COCHRANE, Jr.

Rolland Paper Company, St. Jerome, P.Q.

Mr. JEAN HAMEL, 22nd Batt. R.C.F.
Mr. HENRI PARET.

The Dryden Timber and Power Co., Ltd., Dryden, Ont.

LESLIE V. BISHOP, Corporal Chemists' Corps, Royal Engineers.
A. J. LOCK—"D" Company, 52nd Battalion, C.E.F.
E. H. TOYNE—"D" Company, 52nd Battalion, C.E.F.
Sergt. J. JOHNSON—"D" Company, 52nd Battalion, C.E.F.
LESTER L. LEARMONTH—"D" Company, 14th Battalion, 1st Contingent, C.E.F.
RICHARD CURRIE—2nd Artillery Brigade, C.E.F.

Montreal Paper Company.

A. L. BISHOP—2nd Battalion, 1st Contingent, C.E.F. On firing line since February.

Canadian Leather Board Co., Ltd.

JAMES HARTLEY—2nd Contingent.
WILLIAM HALE—2nd Contingent.

Bathurst Lumber Co., Ltd.

ALEC YOUNG—26 Battalion.
RAYMOND LOZIER—55th Battalion.
ALPHONSE ROBICHAUD—55th Battalion.
MAURICE RIX—55th Battalion.
DON CRAFT—55th Battalion.
J. L. DOUCETT—55th Battalion.
JAMES COLLINS—55th Battalion.
ANGUS BUCKLEY—55th Battalion.

The Abitibi Power and Paper Company sends the following particulars regarding its volunteers:—

Pte. CHRISTOPHER H. "CHARLIE" DAWSON, of the Princess Pats, was killed in action February 28th, 1915. He was born in India, came here from Newfoundland, where he had been shift boss in the A. R. Reed mill. He held the same position here at the time of his enlistment and was one of the most popular boys in the plant.

Pte. WM. SMITH, of the 1st Brigade Field Artillery, 2nd Battery, was born in England, saw service in South Africa with the Imperial Forces. Smith was a first-class signaller, and is said to have been promoted to Sergeant. He was employed in the Wood Room. He was a splendid boxer and gymnast.

Pte. Wm. DONOHUE was born in Canada, served in the Canadian Field Artillery. He and Smith were chums, coming here together from Montreal. Worked in Wood Room.

Corpl. EARL J. WILSON, of the 15th Battalion Highlanders—Corporal of the Machine Gun Section, 15 Battalion, was born in Canada. His father is living in New Brunswick. He was a fine specimen of "Jack Canuck," standing 6 feet 2 inches, and weighing 195 lbs. He was a member of the 97th and had served in the Field Artillery. Was severely wounded at St. Julien, and is one of the few of his section that returned from this engagement. But they certainly gave a good account of themselves. Wilson worked in the Electrical Department. Has been recommended for the Distinguished Service Medal.

Pte. GEO. ALBERT BROWN, 15th Battalion Highlanders. Born in England, member of the 97th Signal Section. Signaller 15th Batt., wounded at St. Julien; a painter by trade, and worked in Master Mechanic's Department. His wife is living in England.

Pte. C. V. PERRY, of the Borden Battery, was born in Canada, enlisted at Toronto, employed in Time-Keeping Department.

Sergt.-Major E. C. MORRIS occupied the responsible position of Assistant Secretary-Treasurer of the Abitibi Company. He is now with the 23rd Battalion, Canadian Expeditionary Force.

G. D. Campbell, senior, the respected father of four volunteers from Weymouth, N.S., writes that his son COLIN was sent to France with reinforcements for the 1st Contingent. He was wounded near La Bassee on June 15th, from a piece of shell, which made a wound about four inches long in his neck. After recuperating in hospitals in France and England, he was sent to the Front again about the 8th of last month.

GLIDDEN CAMPBELL, manager of the Campbell Lumber Company, took his course at Kingston, Ont., in February, and received his commission in April, and is now guarding the wireless station near Barrington Passage, N.S.

KENNETH CAMPBELL was in training during July with the 45th Battalion at Valcartier, having taken his examination and commission at Halifax.

THOS. B. R. CAMPBELL, who is a gunner in the 24th Battery in the 6th Canadian Field Artillery, is now at the Front in France and Belgium.

The Roll is not complete. Many firms have not yet sent in full lists, and some have sent none at all. We urge upon those who are in a position to send in names, photographs or particulars of those who have enlisted to do so at once. The intention is to keep the Honor Roll standing until the end of the war.

THE FRENCH PAPER-MAKING SCHOOL OF GRENOBLE

By M. BARBILLION, Professor of the University of Grenoble.
(Translated by OLIVIER ROLLAND.)

Origin of the School.

A few words will explain the birth of the school and the consecutive stages of its development. Its creation was decided upon at the annual meeting of the Paper Makers' Association of France, in September, 1907, and the doors of the school were opened to students in November of the same year. Eight months later, it was supplied with all laboratory material and machinery necessary for the making of paper. The Paper Makers' Association, whose president is M. H. Chauvin, had appointed a committee to organize the school. Mr. Barbillion, professor of the University of Grenoble, was appointed Director and he was entrusted with the work of completing this organization. His task was made easier by the good will and help found everywhere. The Government, the town of Grenoble and the Chamber of Commerce were all eager to contribute to its success. The Minister of Commerce and Industry subsidized the school.

The school's system is of a special nature. The general scientific training is given by the professors of the University of Grenoble; the special teaching relative to paper making, testing of the paper, micrography, chemistry applied to paper, is given by special professors paid with the subsidies furnished by both the Ministry of Commerce and Industry and the Paper Makers' Association. The programme of the studies, the improvements to be made to the plant, are decided upon by a committee composed of members of the Paper Makers' Association, and representatives of the Ministries of Commerce and Public Instruction.

Teaching.

As now organized, the school is composed of:

1. A HIGHER COURSE, which extends over two years. This can be reduced to one year for scholars possessing a sufficient technical training. The object of this course is the formation of men for the higher administration in the paper mills. The graduates are entitled to the diploma of Paper Maker Engineer of the University of Grenoble.

2. AN ELEMENTARY COURSE, having for its object the formation of future foremen and machine tenders liable to be promoted later as foremen.

The school gives the theoretical teaching and practical training of all the sciences connected with the paper making, and the general instruction necessary to both the paper maker engineer and the foreman. The programme for the higher course is as follows:—

First Qear.

General Chemistry.
General Physics.
Electricity.
Mechanical Drawing.
Advanced Mathematics.

Second Year.

Lectures on Paper Making.
Chemistry, applied to Paper Making.
Industrial Mechanics.
Electricity.
Industrial Construction.
Electro-Chemistry.
Electro-Metallurgy.
Hydraulics.
Industrial and Commercial Law.
Finances.
Accident Prevention.
Industrial Drawing and Designing.
Laboratory Work: Making of paper; testing of paper and industrial chemistry.

Professor Favier delivers the lectures on paper-making.

As it can readily be seen, the founders of this institution have tried to concentrate, in the second year, the study of all subjects indispensable to the future paper maker.

The committee realizes that it is not to be expected from the young graduate Paper Maker Engineer, that he knows all and everything about paper-making. They consider that a stage in a paper mill is absolutely necessary to render his school studies really useful, and to complete his practical knowledge. But the committee is unanimous in stating that the student who has gone through the school course will require a much shorter paper mill stage, and the results that can be derived from such a stage, incomparably improved.

The first batch of Paper Maker Engineers graduated in July, 1909; they numbered twelve. This number of graduates increased slightly at the promotions of the following years. On the first of January, 1914, the total number of graduates since the opening of the school was sevnty-nine, and mostly all of them were engaged in rather important situations in the paper industry or its connected industries, such as construction of paper-making machinery or chemical products.

The School can accommodate a maximum of 40 students. This number should be considered a definitive maximum as, on one hand, the wants of the industry in France do not require any more than the above mentioned number, and, on the other hand, the ratio in the number of students of foreign origin to that of the French students, is strictly limited.

Equipment.

Besides the numerous pieces of apparatus such as microscopes, instruments, chemical appliances, etc., used for research work and testing by the professors and the students, the school is equipped with complete machinery for the making of paper. Quite a number of these machines are gifts from different firms of machinery constructors. The miniature paper mill of the school has received flattering testimonials from many competent visitors.

On the first floor are seen three engines (washing, bleaching and beating engines) donated to the school by the firms of Allmand, L'Huillier-Pallex and Neyret-Bernier; a save-all; an aero-condenser made by Fouche, for getting rid of damp vapours in the machine room.

We may also mention the apparatus for the preparation of resin size; a powerful lift, and a number of accessories for the measuring and preparation of the necessary chemical products. Also, the elements of a beginning museum of the retrospective art of paper-

making; it consists of only a few specimens yet, but, no doubt, will soon be enriched.

On the ground floor, one Neyret paper dryer; a Bouchayer & Viallet rag boiler; drainers; a stuff chest with its agitators. The paper machine is also in this hall. Desirous that the institution should maintain its national character, the order for the construction of the machine was granted to French firms. The machine was made in three parts and constructed by Allimand Freres, L'Huillier-Pallez and Neyret-Bernier, at most favorable price and terms.

This machine is composed of sand boxes; one Lamort rotary screen; suspended Fourdrinier wet part with shake apparatus, suction boxes, wire rolls, couch rolls. Also, press rolls; four drying cylinders of 800 mm. diameter; one set of calender rolls with dampening apparatus; and reels. This machine is driven by a dynamo with variable speed. A sheet of paper of one meter width can be made. The machine measures about 20 meters in length and 5.50 meters in width (drives included). An electric motor of 30 h.p. drives the whole plant.

The school occupies a space area of 1,800 square meters.

Such is to-day the French school of paper-making; it can be compared with the technical schools of foreign nations and ranks among the best.

Selecting the Best Belt Drive

Belt drives cannot be standardized. There are too many conditions to be fulfilled to meet them efficiently with one rule. For this reason, every drive should be calculated separately and carefully to fill the conditions called for by the installation.

To get best results, you must consider these various factors:

1. How much power is to be transmitted?
2. What is the size and speed of the driving pulley?
3. What is the size of the driven pulley?
4. What is the distance between shaft centers?
5. Will the drive be vertical, on the slant, or horizontal?
6. What is the value of space?

Answering these questions briefly, the installer of belts will be enabled to make a wise selection by following the instructions below. In any case, of course, judgment must be used in connection with formulas and mathematics. This is the way to go at it:

1. Power is usually given as "so many horsepower." A wide belt will generally transmit more power than will a narrow one, but much depends upon the belt's speed. Thus, to find the proper width of a belt of single thickness, multiply the horsepower to be transmitted by 800 and then divide by the speed of the belt in feet per minute. The result will be the width of the belt in inches. Where the belt is to be a "double belt," use the figure 500 instead of 800, given above. Otherwise the method of computing is the same.

2. Multiply the diameter of the driving pulley (in feet) by 3.1416. Then, multiply that by the revolutions per minute of the driving pulley. The result is the speed of the belt in feet per minute, which must be used in 1 to compute the width of the belt.

3. Never use a pulley that is too small, either as a driving or driven pulley. Large pulleys are best because there is less danger of slip where they are used; they are more efficient; and by use of large pulleys a narrower belt may be used. Of course, the peripheral speed of the driving and driven pulleys is the same because they are both used under the same belt, and a belt can run at only one speed at one instant.

4. If the distance between shaft centers is great, use large pulleys. You can then use a narrow, inexpensive belt, and the drive will be more efficient than where small pulleys and a heavy belt are used. If the distance between the centers is small, it may be necessary to use an idler, especially if one pulley is small and the other very large. By using an idler it is possible to bring the driving and driven pulleys very close together and thus save the cost of long belts, save space, and sometimes increase efficiency.

5. If the drive is horizontal, always run the "pulling side" on the bottom and the "slack" side on top. The same rule holds where the drive slants. Drives of this kind may be run fairly slack without trouble if the drive is designed correctly and if the belt is properly cared for. But where the belt is vertical, it makes no difference which side is the pulling side and the belt must be run tight enough so that it will surely come in contact with the lower pulley. Sometimes, as in the case of horizontal belts, it is a good plan to use an idler in connection with vertical drives.

6. What is the value of space? Sometimes this questio alone is enough to decide for you whether or not the drive will be long or short. Where space is valuable it is a good plan to bring the driving and driven pulleys as close together as possible. Personally, I prefer the short drive with pulley centres close together and with a good slack belt, made so either naturally or by the aid of a well-placed idler. Belt cost is thus lessened and the system is made ideally compact. If you must use an idler, by all means do not run it too tight.

The above holds true for all kinds of belting—leather, canvas, rubber, etc.—N. G. Near, in "American Miller."

EASTERN MILL BURNED.

One of the fiercest conflagrations of the year occurred recently, when the Miramichi Mill Plant at Chatham, N.B., was completely destroyed, at an estimated loss of $50,000, the only portions of the big plant which escaped, being the offices, situated in a corner farthest away from where the fire started.

The mill had not been operative for four years, and a year ago changed hands with the Dominion Pulp Company. Since then a large quantity of the valuable machinery has been removed, but a very large and fine equipment still remained in the machine shop, which was all destroyed.

Some delay was experienced in getting the fire alarm to work, and when the firemen arrived, the flames had made such headway it was impossible to save the building, and they devoted their efforts towards saving the surrounding property, which was constantly threatened. The falling cinders started small fires in houses across the street, but such a strict watch was kept that they were extinguished almost as soon as they ignited. The origin of the fire is unknown.

HIGH SPEED NEWS MACHINES

By JOHN W. BRASSINGTON.

(Written Specially for Pulp and Paper Magazine.)

Having read in some of the paper periodicals issued in the last few months, a statement that a high speed news machine is not an economical machine above a certain paper speed, together with the statement that a newspaper mill is more economical in operation when the paper machines are not running over say about 500 feet per minute, the writer felt constrained to inquire carefully into the underlying reasons for statements to him so iconoclastic. After considerable research, it appears that these statements largely rely for their veracity on the fact that in one or more mills, an increase in speed of the paper machines resulted either in reduced capacity, owing to a greater number of breaks, or else in the enforced use of a larger quantity of sulphite, in order to prevent such an increase of broke.

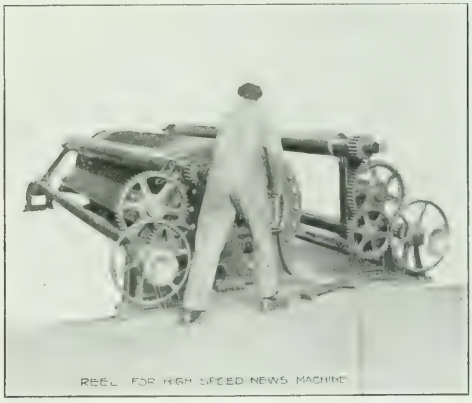
It is not feasible for the writer to name this mill or these mills, because he is not informed either as to location or ownership; it is therefore, equally impossible for him to describe the paper machines in them that have shown themselves to be uneconomical at high speeds. It is a bold thing to challenge statements such as the above, when they are evidently made by experienced paper manufacturers, who are also executives and thinking men; yet the very quality of mind of the authors of these statements will enable them to follow carefully the arguments that follow this preamble, and deal gently with the deponent.

It is not possible to make out a perfect case when all the circumstances are not thoroughly known. It is possible for a very thoroughly efficient paper maker to be such and not know the several distinctive differences that segregate both high speed news and moderate speed news or book machines, each into a class by themselves.

It was only recently the writer was looking over a book machine that the owner wanted to make over into a high speed news machine. The mill superintendent was evidently a splendid man in his knowledge of papermaking, an enthusiastic executive, a good engineer and mechanic; indeed, after two hours of his company, the writer felt they were two hours well spent for the information obtained; yet even this man's conception of the changes necessary in the machine in question, in order to make news at high speed was rudimentary, and if such only should be made, then the quantity of sulphite or the alternate amount of broke when running would wipe out all profits due to higher speed.

When a firm of paper machine builders has been in active business for a half century, it is obvious that they become possessed of specialized information covering the apparatus they manufacture, that is not attainable by those whose life work leads them to other sources of knowledge. An employee of such a firm, having access to such specialized information, can see points of excellence or imperfection about a paper machine that would completely escape the observation of the paper maker. The latter, of course, can see the degree of finish, the quality, and formation of a piece of paper with a quickness of vision that cannot be emulated by the former. It is a case of every man to his trade. The three great trouble makers that make the path of the paper maker hard, when the paper speed begins to exceed 500 feet per minute, are called centrifugal force, friction and vibration; generally negligible at speeds below 500 feet per minute, they begin to mutter and complain about receiving their just dues at just about 500 feet per minute peripheral speed of the paper machine rolls. Gathering strength as the speed increases, they begin to demand attention at from 550 to 600 feet per minute, and from 600 feet up, they force implicit obedience to all their whims, or else no paper can be made on the machines they then control.

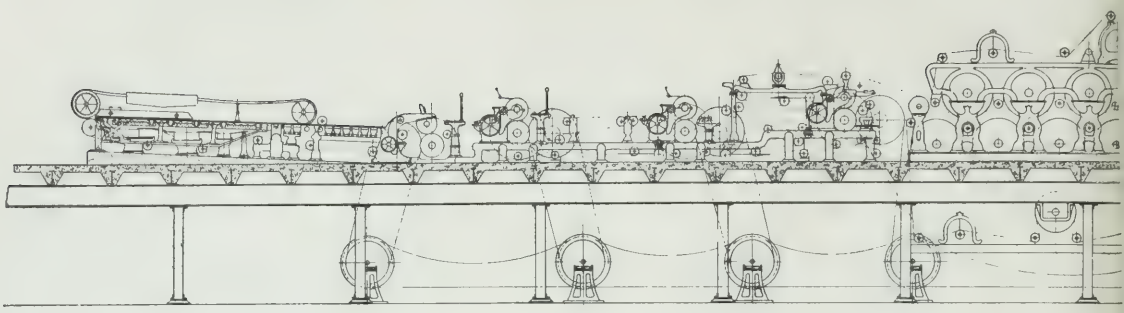
Let us consider centrifugal force first. Unless the table rolls are big enough to suit, this force will swing them out of centre in the middle, and also accentuate any want of dynamic balance that may already exist —the result of such conditions under the slice, or anywhere, for that matter, under the forming table, is



REEL FOR HIGH SPEED NEWS MACHINE

enough to insure a good supply of "broke" for the beaters, due to lack of uniformity of the sheet. So it is often absolutely necessary to increase the diameter of the table rolls in order to speed up a machine. Again, the wire rolls and felt rolls throughout the machine begin to give trouble at high speeds, due to the strain set up by centrifugal force; in consequence the clothing of the machine is destroyed more rapidly as well as the causes of paper breaks being multiplied. At 600 feet per minute, the syphons and dippers in the dryers cease to act, and the winder drums, which, of course, largely exceed this speed in order to keep ahead of the machine, begin to "chatter" the cores or the paper rolls.

Under the heading "friction" is enumerated all the trouble with lubrication, resulting from high speed. The small couch or press rolls with large journals so prevalent in the medium speed paper machines are unsuited to high speeds, and it is hard to keep the journals cool; the paper maker condemns the machine when he has to pick paper off a small roll revolving at high speed. The gears on the dryer nest and on the drive often well suited to medium speeds, begin to develop bad leads from couch to presses, to dryers and through-

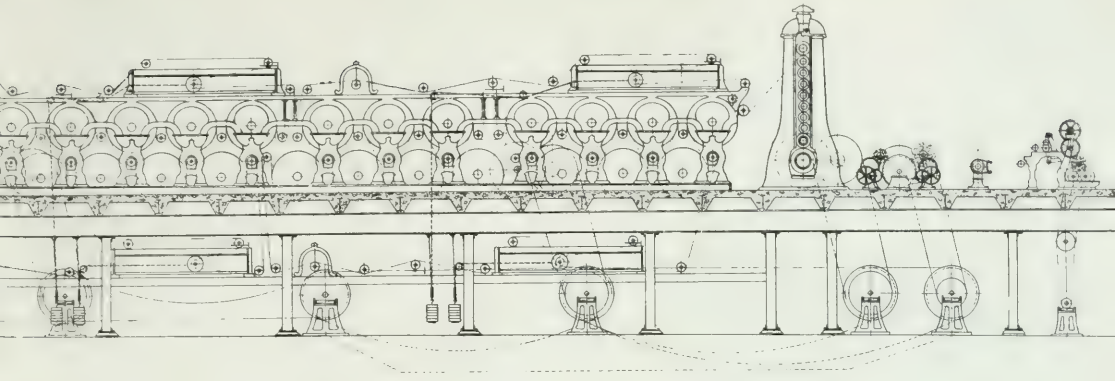


Modern News

out the dryer nest. Every time the inaccuracy in mesh of the gears, that passed unnoticed at the slower speed, comes into contact at the higher speeds, it snatches the paper and causes a well defined slap at the higher speed. It is possible to make paper up to say 300 feet per minute on a paper machine that is poorly designed and ill put together, but it is a very different thing to try to make paper at 600 feet and over per minute. It is then necessary that the machine be designed for the speed at which it is to run, in order to obtain success. Thirty pound paper can be made of nearly all ground wood at speeds well over 600 feet per minute, without a break in the live-long day, but the paper machine fitted for this task must be designed for it, and not be a make-over machine, originally satisfactory at say anywhere from 400 to 500 feet per minute, with from 20 per cent to 30 per cent sulphite in the stock.

The third great trouble maker is Vibration, and it is one of the most troublesome because the most elusive, and also at times the most destructive. If you stand and watch the stuff flow over the fourdrinier wire of a high speed news machine, you will sometimes notice a tremor or series of wrinkles disturb the placid surface. When this is the case, take out your watch and time the recurrence of this phenomenon. You will find its periodicity to be regular, sometimes one long and one short, or two longs and one short surface disturbance, but always the time between cycles will be constant. This appearance comes when the vibration of the table rolls, which largely increases at high speeds, come into time with the vibration of the side rails. The vibrations of the side rails may be caused by lack of rigidity of building, by shafting hanging on foundations and many similar causes. Such vibrations are generally negligible at low paper speeds, but it is possible for them to break a heavy casting or a 6 inch diameter shaft at the higher speeds, where the stronger vibrations are more likely to get in time together. Any man who has handled barrels, knows how by rocking to and fro, a weight can be gradually accelerated until it is thrown; this principle of acceleration by successive small increments of force timely given, is the secret of the power of vibration to destroy. The writer remembers seeing a brick building rock on its foundations because numerous machines in it with reciprocating motion, moved in unison; the rocking was cured by timing the machines against one another.

Modern Book

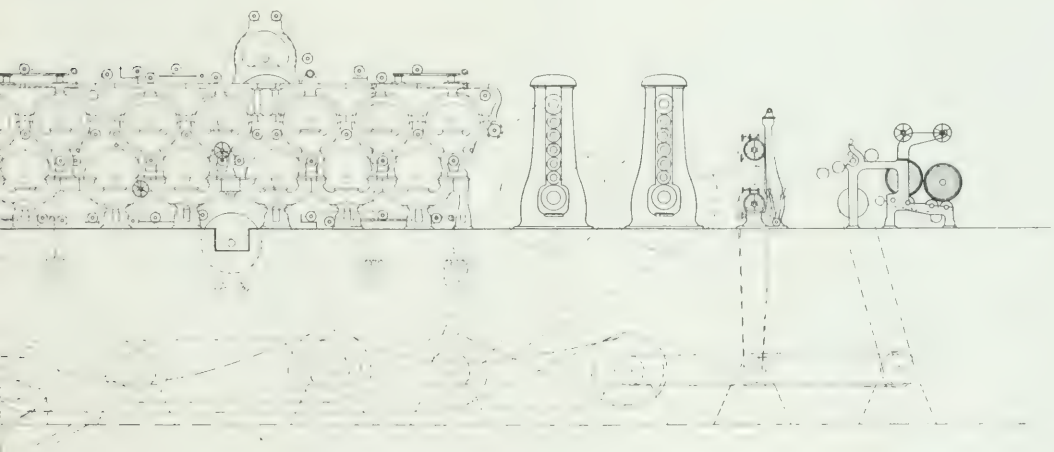


chine.

When a paper machine is designed for high speed, care should be taken that the length of vibration wave of the driving shafting between bearings is not in time with the side rails of the machine, with the floor beams or columns of the building itself, if of light construction, or with the table rolls. Even the wire may vibrate between return wire rolls, if the speed is high enough. It is surprising how much damage to a wire a slight whip on the rolls will accomplish. It is not, however, the fact of the existence of vibration in themselves that is the dangerous element in high speed paper machine design; it is the possibility of the vibrations getting in time, for the increment each gives then to the other in reciprocation can easily bring into being a condition which will continuously tend to break the paper.

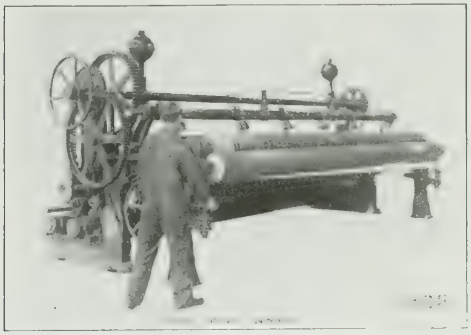
Another element that demands attention in designing high speed paper machines is the effect on the rolls of the continuous reversal of strain. Take, for instance, a table roll six inches in diameter on a wide news machine running at 700 feet per minute. Such a roll will revolve over 450 times a minute. Its own weight accentuated in effect by centrifugal force, together with the weight of the stuff may deflect such a roll one-eighth of an inch in the midle, that is, it will sag that much. Now this sagging action is reversed 450 times a minute, or about 129,000 times in a day. If you want to break a piece of wire and have no wire cutters handy, you simply bend it backwards and forwards until it snaps. Truly, the roll is not bent much, but 129,000 reversals every day have their effect in good time, so that the roll casing naturally crystallizes and breaks like a piece of glass. The only way to take care of this trouble is to make the rolls big enough so they sag very little, and then see to it that they are in dynamic balance; the larger the diameter the less the centrifugal force for the same peripheral speed, while the absence of unbalanced dynamic weights in revolution is a great factor in prolonging the life of a roll. If a table roll is revolving so swiftly that its angular velocity around its axis is high enough to throw off all the water that flows onto it, through the wire, then that roll will not take as much water away from the wire as it would, were its surface wet when it comes up again to the wire.

It is an indubitable fact that the range of diameters



Machine.

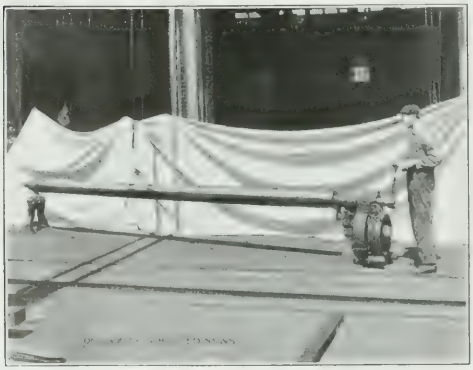
suitable for the press rolls of high speed paper machines, of any given width, is small. For instance, it becomes almost second nature to the machine designer to note that the press roll of the machine he is look-



ing at is too large to allow the water to escape from the nip at high speeds, while in another case, the roll may be too small to enable the machine tender to take the paper off conveniently. There is a nice balance to be struck between weight per inch of bearing and peripheral speed of journal for speeds of over 600 feet per minute.

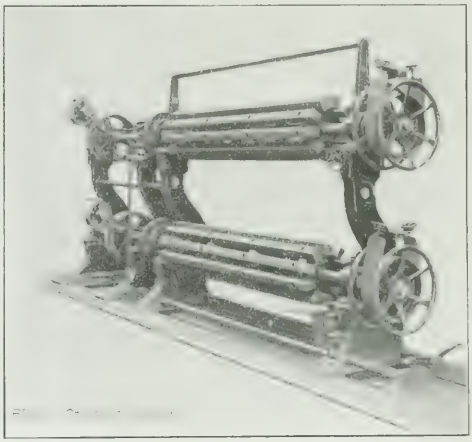
The question of proper control of the dryer nest so as to maintain capacity is of great importance in the case of high speed machines, because the condensation effect in the first few dryers is excessive. Syphons will not work at over 600 feet in 48 in. diameter dryers, because of the strength of the centrifugal action; dippers have to be balanced, and must be provided with an interior trap and reservoir to insure continuous action, or they too cease to act at about 650 feet, even in 60 in. diameter dryers. A dipper can be installed so that it will work successfully at 1,200 feet per minute in a 60 in. diameter dryer, and at about 900 feet per minute in a 48 in. diameter dryer.

A high speed news machine, to produce commercial



rolls of paper continuously, must have a very different reel to that which may serve a medium speed machine very successfully. The drag of the wire on the stock in a high speed machine tends to make every fibre duck under the slices head first, just like logs go over a dam; they always go head first unless actually square across so that one end does not get over even a little ahead of the other; again, if the wire is not sufficiently pitched or the velocity of the stock not sufficiently accelerated by a high head back of slice, the stuff will show a wavy ripple right across the machine from deckle strap to deckle strap, and sometimes a longitudinal wave from the deckles in towards the centre of the machine.

The speed of the shake as well as the throw, is as important as the acceleration of the stuff, by the pitch of the wire, or by any other means. When a fibre travels 600 feet a minute, it enters and leaves the forming table in about two seconds, while the shake head is revolving about seven times, with say a ¼ in. throw. The only way to get full advantage of the shake under these conditions is to make sure of a full sine curve, as its characteristic, and to time that curve to the rate of flow of the stuff and the harmonic vibration of the side rails at that speed. This sounds very complicated,



but is not really so; the proper adjustment of the compensating springs, together with the supporting springs on a modern high speed news machine, automatically adjust the rhythm of the throw to the length of rails.

The position of the wire stretcher roll, together with the angle it fills in the wire, are of secondary importance, providing that the standard limits of this angle are not exceeded, as this controls in a large measure the life of the wire.

To the paper machine manufacturer, there is a very great difference between a medium and a high speed machine, the latter requiring a much greater care in design and skill in building. In short, a well-designed high speed news machine is a triumph of the art of machine design; it is as a race horse to a cart horse, when compared to a book machine. Both types of horses are good in their place, but as it is unfair to expect the cart horse to run with the racer, so it is not just to ask a medium speed machine to speed up say to 600 feet or 650 feet per minute, because a few more dryers have been added and a new drive. If this is done, the machine will run at the higher speed, but it will not make paper without either continual breaks or a larger percentage of sulphite in the stock.

Some men do not know a fine breed of dogs, or chickens, or horses or cats when they see them; other men do not know that one kind of paper is any different to another, and there are also others to whom all paper machines look alike, yet every just man is willing to allow that striking differences may exist which are only visible to the trained observer in each and all of these things.

In writing this, the indicative and the imperative moods may have been used when the conditional would have been more suitable, when considering the facts offered by the gentlemen who stand back of the statement that a high speed news machine is an uneconomical addition to a paper mill. Yet this statement is so astounding and iconoclastic in the ears of the writer that he has been convinced in his own mind that those making it must have overlooked the enormous difference between paper machines made for book and medium speeds, and the high speed news machines that are a specialized product.

A fine book machine has points in design that look to the finish, bulk and formation of the product that are not necessarily placed on a high speed news machine, but the extreme accuracy of fit and the centering of gears can in this case be a few thousandths of an inch out without destroying the capacity of the machine in any way, where the same inaccuracy would largely decrease the output from a high speed news machine. In the case of a book machine the question of crown, density of rubber and deflection of rolls has importance for another reason altogether from the question of speed; the maintenance of the proper width of roll contact with regard to its effect on bulk and finish is most carefully looked after in a book machine, while causes that militate against speed are less important. Illustrations show parts of the two types of machines.

Knowing these machine facts, and realising how little they are appreciated by the untrained vision, the writer has endeavored to courteously point out some of the differences between the two types of machines, and he trusts that his efforts have been successful. There are numerous minor points of difference which if enumerated would only fog the issue, so these have not been covered in this writing. If there is any valid reason outside of the paper machine itself which makes it an uneconomical action to increase output of a mill by speed, it is not within the province of the writer to pass judgment on such a reason; yet even to the outsider, such a reason would appear to need strong circumstantial evidence to support its validity.

ALUM

The aluminous material used to the largest extent in making alum is a substance resembling hard clay, known as bauxite. It is largely composed of "hydrate" of aluminum and is readily dissolved and converted into sulphate by the action of the acid.

Cake and Lump Alum.—When a solution of alum is evaporated to the proper extent, it is poured on a slab and solidifies into a cake. This is broken into lumps, and cannot be used in the beater without dissolving first in water.

Ground Alum. — The lumps of cake alum are ground fine and can be furnished to the beater dry. It is better, however, to dissolve it first as it acts better in a slow revolving engine.

Character of Alum.—Alum is acid and corrosive in nature and destroys iron pipes, etc., but acts only slightly on bronze and not at all on wood, lead or rubber. In dissolving, therefore, it is better to use wooden tanks with wooden or bronze agitators. Lead pipes should be used to carry it to the beater.

$$\frac{\text{Alkali}}{\text{Sulphate}} + \frac{\text{Metallic}}{\text{Sulphate}} - \text{Alum}$$

Alum for ordinary news is pure enough when made from bauxite or clay, but for high grade paper where a small percentage of iron in the alum is objectionable the alum used should be free from same. At some places alum is made at the paper mill by buying vitriol and the hydrate and dissolving it in the tanks. The solution is not evaporated, but is run in the beater in the liquid form, which is an advantage.

Zinc and Alum. Sometimes zinc is added to the alum to decolorize the iron. This is of no advantage, for as soon as the alum in the paper is exposed the iron is oxidized again to a yellow color giving an inferior colored paper. In whatever form alum is produced, it is always best to dissolve it before furnishing it to the beaters as it is distributed more evenly and gives a better effect.

Furnishing Alum.—A measuring box is placed above the beater and connected below with a lead pipe leading to the beater. A pointed stick is fitted in the hole at the bottom. The alum solution is run into the measuring box in the desired quantity, the stick is pulled out of the hole, and the alum run into the beater. The solution may be of any strength, but one pound to a gallon is more convenient to use.

What Alum Does.—It is ordinarily thought that alum is for sizing paper. A careful examination shows that it does much more. It has its good and bad effects and for this reason should be used carefully.

Harmful Effects.—The harmful effects of alum in paper is that it renders the paper brittle, causes it to lose moisture rapidly, and although it imparts a rattle, which is a desirable feature it is unfortunately true that such paper deteriorates quickly. For this reason it is best to use the smallest amount possible to give the desired results, and also to use other things, such as silicate of soda, starch, etc. in order to get the desired degree of hardness or rattle. Alum used in excess also has an injurious effect on paper machine clothing, especially on the dryer felts. The rottenness of dryer felts, which is attributed to the scorching or burning heat from the dryers, is due to a large extent to the alum which is absorbed from the wet paper into the felt, where it accumulates. The action of this accumulated alum, together with the heat from the dryers causes the felt to be tender, brittle and rotten. This effect can be observed by soaking a cotton cloth in alum, allow same to dry and notice the brittleness of the cloth.

Benefits of Alum.—The main object for which alum is used is to "set" rosin size. For this nothing has been found as cheap or as effective. Alum also "sets" certain colors and makes their effect much brighter and stronger. In other cases, however, it tends to weaken colors. Its use therefore should be carefully regulated, according to the colors used in the paper. Some of the

colors give their best effect with little alum, some without alum. If it is necessary to heavily size a paper with colors which require no alum, it is necessary in order to get the best coloring effect to use sufficient size and only enough alum to set this amount—as more alum will weaken the color.

Action of Alum.—It seems to be the general impression that alum strengthens all colors and keeps the color from washing out of the paper, so that when any highly colored paper is made, it is customary to use more alum. This is wrong in many cases as described above, though in other cases it is correct. If a certain grade of blue and red is used, the more alum the better, and the less the color is washed out of the paper.

Clearing of Water by Alum.—In addition to the setting of size, alum has an important effect on the clearing of water. If the water is turbid by the presence of clay and slime, it cannot be filtered clear and bright, as the slime will pass through the pores of the paper and the water come through turbid or will clog the filter so no water will come through at all. In such cases, an addition of alum to the turbid water, clears it, by causing the slimy material to flock or coagulate in masses leaving the water above clear and bright. It is thus readily seen that alum possesses this clearing property, and will have some action when mixed with the paper stock. The particles of clay and other fine material will be less liable to wash out or be sucked out by the suction boxes on the wire, etc. In other words, alum contributes to the retention of clay.

Hardening Action of Alum.—Alum hardens nearly everything, such as glue, paste, etc. It acts upon woody matter in the same manner, hardening it and giving paper made from wood a hard or stiff character. This is sometimes called the sizing action of alum, and it is stated that alum will alone size paper. This is not correct, as sizing paper is a process by which the paper is made impervious to water and it is accomplished by rosin and other repellant substances. Although a paper made with the use of alum is harder and stiffer than if no alum were used it is not impervious to water to any extent. Its general appearance and feel is similar to a paper which has been sized, but it should be borne in mind that alum is not a size, but simply a stiffener or hardener.

Soft Paper—It is sometimes desirable to make a soft paper, that is well sized such as "hanging." In order to obtain this result it is necessary to use a larger amount of rosin and a smaller amount of alum, simply enough to set the size, and allowing a little of same to be washed out. A little of the size is let out and a little trouble with the foam is occasioned, but the desired result as to softness and sizing of the paper is obtained. If too much alum is used the paper will be too brittle or too hard.

Foaming.—Alum prevents to some extent the foaming caused by size, especially from new size from which the liquor has not been well separated. In cases where an excess of alum is not objectionable it may be used in moderation for this purpose, but it is better to kill the foam with a spray of water or an air blast.

Action on Pitch.—Alum acts on the paper machine wire to a slight extent and keeps the same bright. A wire will run longer if an excess of alum is not used, but at such times when pitch is bothering to an unusual extent it has been observed that alum prevents this to a great extent. To use alum in large quantities to cure pitch, alum should not be used carelessly on account of the bad effect it has on the machine clothing.

Alum Used With Caution.—Paper making is a mechanical process and as the quality of it, such as news, depends more upon the grade of ground wood and sulphite, and the manner in which it is manipulated upon the machine, than to the amount of chemicals that are added, when the quality of paper is not what it should be, the remedy is to be found in the improvement of the machine, such as speed, shake, drying, or calendering rather than dosing the stock up with a lot of clay, alum, size, etc.

It is advisable for one to make the best quality of paper with the stock furnished, and if it is found necessary to use an extra amount of size or alum, because the wood pulp is too coarse and the paper will not retain a good surface, it is the proper thing to add chemicals, but to make a regular practice of using them instead of finding the proper remedy for the fine grinding of pulp, etc., it is a wrong method. It is a good rule to make improvements to the pulp or the machine if they can be accomplished without using chemicals.

Alum Lost.—Of all material lost in papermaking, alum is lost to the greatest extent. It is soluble, and therefore does not remain in the paper to increase its weight, except a very small percentage, which combines with the rosin i nthe size. All the rest, including the amount required to set the color, killing foam, keeping pitch from sticking to wires, is lost in the waste water running from the machine. If every pound used were retained, it would be well to use it, but as the opposite is the case and together with this, it has several harmful effects, its use should be regulated.

Quantity to Use.—In ordinary news paper where little or no size is used, use enough to set the size and develop a bright effect. The amount varies in different localities, on account of the variation of the water. All natural water contains a small percentage of mineral matter, which combines with the alum used. This amount, however, makes a difference of only a few pounds to a 1,000 pound beater. For news 10 lbs. to a beater is the best amount to use where the re-water is used. Occasionally a little more may be used, but the practice should not be kept up.

Alum to the Beater.—Alum should be always furnished after all other materials have been put in and are evenly distributed. Size and color go first. Alum should be last and then it sets the size and color evenly, thus avoiding size spots and irregular stock.

Size and Alum.—Size is made by dissolving rosin in soda. Rosin is not soluble itself, but when boiled with soda it will dissolve. When size has been well distributed in a volume of water and the alum then added, the insoluble particles separate out of the solution in the form of small particles which mix with the paper fibre. If the alum is added to the water first or if the size and alum are added at the same time, especially if the size is thick, it is easy to see the small particles of thick size which have not had a chance to dissolve well, coming in contact with the alum ore, etc. "set," and then have no power of dissolving except possibly in the jordan where they are broken up more, and size spots are visible in the paper. Often times new size is blamed for this, but the size may have been too thick and the alum added too soon.

Colors and Alum.—The same is the case with color. Those colors which require alum for their development, are soluble in pure water or water made alkali with the size, but are insoluble with alum water. For this reason we say that "alum sets the color" or fixes the

color on the fibre so it will not wash out. Therefore if alum is given to the engine before the color is put in, the water in the engine is in condition to set the color as fast as it is delivered, fixes itself on the first fibres it comes in contact with. Some are highly colored, and others are colored but slightly. If the color is first added and completely dissolved, or better still, have the color dissolved in hot water beforehand, then dump same to the beater, where it is evenly distributed. Then when the alum is added it finds the color well mixed and sets it on the stock evenly.

Recapitulation.

1st.—It is sulphate of aluminum, containing more or less water. It is manufactured in many forms and grades, as to purity and strength.

2nd.—It is used in paper making for many reasons. Sets size, fixes color on the fibre, hardens the fibre, reduces foam, prevents pitch forming on the wire.

3rd.—Certain properties are bad, such as the action on felts, causes paper to dry rapidly, become brittle and weakens some colors.

4th.—Should be dissolved before giving to the beater and should be furnished last.

5th.—To make a soft well-sized paper, use much size and only enough alum to set the size and develop the color. Also warm the stock to 10 deg. F. before the alum is added. To make a hard paper, use less size and an excess amount of alum than is necessary. It is better, however, if a hard paper is required which will rattle to use silicate of soda or starch instead of an extra amount of alum and lessen the danger of having the paper too dry and too brittle.

6th.—Correct in a mechanical way if possible. Proper ground wood pulp and good sulphite will make good paper if run properly on the machine. Chemicals are only helpers.

7th.—The composition, purity, strength and the other important properties of alum can only be properly judged by chemical analysis.

THE TECHNIQUE OF PAPER TESTING

For the investigation of the chemical properties of paper we shall require a knowledge of the simple processes of chemical analysis, together with the necessary apparatus concerned. A short resume of the principal simple chemical operations involved in paper testing is, therefore, given below.

Evaporation consists in heating a liquid until part or the whole has been driven off as vapour. Solutions of inorganic substances may, as a rule, be heated directly over the flame of the bunsen, but solutions of organic substances which would char by direct heating, and of volatile and inflammable bodies have to be evaporated over the water or steam bath. This latter consists of a metal utensil with a loose cover perforated with several large holes, and containing water. Over the holes are placed the porcelain evaporating basins holding the liquid to be evaporated which is thus exposed to the action of the steam from the water. A liquid which is being evaporated over a flame is liable to what is known as "bumping," i.e., a tendency of the heated liquid to jump about instead of boiling quietly and to upset the vessel containing it. "Bumping" may be prevented by the addition to the liquid of one or two pieces of clay pipe-stem.

Drying is the process of driving off water from hygroscopic bodies, and is conducted by means of heated air in an air oven. The air oven consists of a square copper box with a door and standing on legs which enable it to be heated by means of a burner underneath. A thermometer passing through a hole in a cork in the top allows the temperature to be regulated any desired degree. Bodies are usually dried at a temperature of about 105 deg. C. After drying a substance can be kept for some time without taking up moisture again by keeping in a desiccator, which consists of a glass jar with an air-tight lid and two compartments separated by gauze. In the bottom compartment is kept chloride of lime which by continually extracting moisture from the air above renders the latter perfectly dry.

Ignition consists in the strong heating of a substance whereby all organic matter is burned away and only the inorganic ash remains behind. Ignition may be performed in porcelain or platinum crucibles, or else on platinum foil or wire. Crucibles should be supported on pipeclay triangles at a considerable angle to enable the oxidising action of the air to have full play. The weight of a platinum crucible should always be freshly determined as the metal has a tendency to waste under the action of the coal gas flame.

Precipitation consists in the formation of an insoluble substance from a mixture of two soluble ones, and is used for the separation of bodies from each other. The insoluble substance formed sinks to the bottom of the precipitating vessel, being known as the precipitate. Where precipitates are quite insoluble in water and finely divided the liquids containing them should be boiled before filtering. Boiling tends to coagulate the particles and obviate the finer portions passing through the paper. Certain precipitates, however, must under no circumstances be boiled in this way. Precipitates are removed by

Filtration, which consists in collecting a precipitate upon a filter paper held in a funnel, on to which the liquid to be filtered is poured down a glass rod to obviate loss by splashing. The clear liquid passing through is known as the filtrate. Filter papers should be moistened with distilled water after being folded into the funnel and before use. In qualitative analysis precipitation is usually conducted in test tubes, quantitatively in hard glass breakers.

Fusion consists in the liquefaction of a solid body by heat. Fusion is conducted in a crucible either of porcelain or platinum.

Weighing is done by means of the chemical balance. Upon the integrity of the balance depends the value of the whole of the chemist's quantitative work. It should, therefore, be treated with a corresponding degree of care and a few hints on manipulation are therefore given here. The beam of the balance must never be left resting on the knife edge. The plumb line

Henry Aldous Bromley in "The Paper-Maker and British Paper Trade Journal."

must hang true and the pointer should indicate the centre division of the scale before commencing to weigh. Any adjustment necessary to make the pointer central is obtained by screwing in or out with the fingers the milled nut provided on the beam. The object being weighed should always be placed in the left hand pan and the weights in the right. Commence with the largest weight likely to be required and if too heavy substitute the next, and so on, always picking up and replacing each weight with the forceps before trying the next. Raise the beam gently and slowly, and allow the pointer to swing twice each way before deciding that no more weights are required. Make your last reading with the glass front down to avoid influencing the balance by draughts. Chemicals must never be put on the pans without being placed in a watch glass or similar receptacle first. Always lower the beam before attempting to lift off weights. Hygroscopic substances which would absorb moisture during the operation are weighed in stoppered weighing bottles out of contact with the air, the weight of the bottle being previously determined. Sulphuric acid is usually kept inside the balance case to keep the air as dry as possible.

Besides the balance the apparatus required in the quantitative analysis of paper are

Measuring Flasks for making up solutions of definite strength. These consist of stoppered glass flasks with long narrow necks with a mark upon them indicating the level of a definite quantity of liquid (water at 60 deg. F.) as 250 c.c., 500 c.c., etc. In using these flasks the bottom of the meniscus formed by the liquid in the neck must coincide with the mark when the latter is held on a level with the eye.

Measuring Cylinders or **Mixers** are tall cylindrical stoppered vessels graduated up the side in cubic centimetres. They are suitable for measuring quantities roughly and also for shaking liquids together. For more accurate measuring they are replaced by the

Burette, which consists of a long cylindrical glass tube usually of 50 c.c. capacity graduated accurately in cubic centimetres and tenths, and having a tap at the bottom enabling the contents to be delivered drop by drop when necessary.

Pipettes are glass tubes constructed to allow of definite quantities of liquid being transferred from one vessel to another. With a pipette the finger is held over the top to prevent the liquid, which is sucked up with the mouth, escaping.

In the chemical analysis of paper certain reagents are in constant requisition. Details of their composition are, therefore, given below.

Phloroglucine.—This is a somewhat expensive substance which is required for use in the form of a solution. The solution is made by dissolving 5 gms. in a mixture of 125 c.c. distilled water and 125 c.c. strong hydrochloric acid. It is most usefully kept in a bottle of which the glass stopper is elongated to a rod which dips into the liquid and can be removed to convey a drop of the solution at a time. The solution deteriorates in course of time going darker in color, and should only be made up in small quantities at a time.

Aniline sulphate is a crystalline body soluble in water. The solution is prepared by dissolving 5 gms. of the salt in 50 c.c. distilled water and acidulating with one drop of sulphuric acid.

Tannic acid.—The reagent is prepared by saturating 250 c.c. of hot distilled water with the dry acid, which should be of a pale brown color. The reagent looks like very strong tea and is employed a few drops at a time.

Iodine solution.—One crystal of iodine is dissolved in a small quantity of distilled water containing a little postassium iodide. The solution is then diluted until it becomes of a lemon color.

Millon's reagent is prepared by treating a little mercury with its own weight of fuming nitrid acid (s.g. 1.4) and gently heating until the metal is dissolved. The solution is diluted with twice its bulk of water, allowed to stand until a deposit forms, and the supernatant liquid decanted for use.

Copper sulphate test.—The reagent is in two parts, kept in separate bottles. The first solution consists of 5 gms. pure copper sulphate dissolved in 100 c.c. distilled water, and the second of 2 gms. caustic soda dissolved in the same quantity of water.

Schiff's reagent is prepared by dissolving a crystal of magenta in distilled water and cautiously adding a solution of sulphur di-oxide until the color is almost but not quite destroyed. The reagent is then allowed to stand until completely decolorised.

Fehling's reagent consists of two solutions to be kept in separate bottles. The first solution is prepared by dissolving 34.64 gms. of pure crystallised copper sulphate in distilled water and diluting to 500 c.c. and the second by dissolving 70 gms. of caustic soda and 180 gms. of pure Rochelle salt in distilled water and diluting to the same bulk. The two solutions are mixed in equal proportions just before use.

Fusion mixture consists of equal parts of pure dry sodium and potassium carbonates.

The Chemical Reactions of Certain Fibres.

Mechanical (ground) **wood fibre** is easily detected in paper by one or other of the following reactions:

1.—A drop of the phloroglucine reagent applied to paper containing mechanical wood fibre develops a brilliant red color deeper in proportion to the quantity present. With a little experience it is possible to estimate the proportion of mechanical wood by the depth of color to within 20 per cent. The rate of development of the color is also an indication of the quantity of wood present. Any lignified fibre will give this reaction which is also developed to a certain extent with low boiled sulphite pulp, and where doubt exists reference to the microscope will be necessary. Certain aniline colors as Metanil yellow develop a red color with hydrochloric acid and the beginner is usually warned against mistaking the color produced in this way by the acid in which the phloroglucine is dissolved, for that due to mechanical wood. In reality the two colors are quite distinctive, that from the dye being a violent shade of red, and the difference once seen there is little likelihood of confusion.

2.—Aniline sulphate applied to mechanical papers develops a yellow color not quite so distinctive or so rapidly developed as the red with phloroglucine.

3.—Immersed in Schiff's reagent in the cold mechanical papers cause the restoration of the magenta color. The reaction which depends upon the presence of an aldehyde, is also given by straw, esparto, and other fibres, but in the case of mechanical wood is developed much more rapidly.

Straw and Esparto are detected by warming a small piece of the paper containing these fibres in a basin with the aniline sulphate reagent which imparts a rose-pink or red color to the paper, the depth of color depending on the proportion of fibre present. Esparto gives a more pronounced reaction than straw, the color depending on the proportion of furfuraldehyde present.

The above are the only fibrous materials that can be identified by chemical means with any certainty in paper. Some observers have claimed to be able to distinguish chemically between sulphite and soda pulp, but the results produced are of very dubious value.

The Reactions of the Mineral Matter in Paper.

The mineral substances commonly found incorporated in paper are China clay, Pearl hardening (calcium sulphate), and Agalite (talc). In addition to these may be present alum from the sizing materials, and in coated papers Blanc fixe (barium sulphate), and Satin white (calcium sulphate with alumina). All these bodies being incombustible are found in the ash upon incineration of a paper containing them, and their separation and identification may present some difficulty.

Satin white and Pearl hardening are entirely soluble in warm dilute hydrochloric acid without change. Their presence may, therefore, be confirmed by the addition of barium chloride to the solution, which will occasion a white precipitate of barium sulphate if they are present.

China clay is insoluble in hydrochloric acid. It is soluble in boiling sulphuric acid but is best detected by treatment with fusion mixture, by which the alumina is converted into carbonate and the silica into soluble silicate, enabling the two substances to be separated and identified.

I.—The Filtrate may now contain:

Sodium and potassium **sulphates and silicates.**

A portion is acidified with dilute hydrochloric acid until all effervescence has subsided, and barium chloride added.

A heavy white ppt. insoluble in acids indicates the presence in the original ash of a **Sulphate.**

A portion is acidified with hydrochloric acid and evaporated to dryness. Any residue is taken up with boiling water and more acid.

A white gelatinous flakey ppt indicates the presence in the original ash of a **Silicate.**

II.—The Residue may comprise:

Calcium, barium, magnesium and **aluminium** carbonates and hydroxides.

Dissolve in dilute hydrochloric acid, filter and evaporate, filtrate to small bulk. Add ammonium chloride and strong ammonia in slight excess. Filter any ppt.

A white gelatinous ppt indicates the presence in the original ash of **Alumina.**

N.B.: A mere cloud will be due to the alum of the sizing.

To the filtrate add potassium chromate and filter off any ppt.

A lemon yellow ppt. indicates the presence of **Barium.**

To the filtrate add ammonium carbonate and filter off any ppt.

A white ppt indicates the presence of **Calcium.**

To the filtrate add more ammonia and then sodium phosphate. Shake vigorously.

A white crystalline ppt. indicates **Magnesium.**

Blanc fixe is also insoluble in acids and is detected as with China clay by fusion, barium carbonate and sodium sulphate being formed.

Agalite in like manner is converted into magnesium carbonate and sodium silicate.

The presence definitely confirmed in this way of calcium and a sulphate indicate the presence of Pearl hardening in the original paper. In the same way, calcium, alumina, and a sulphate indicate Satin white; barium and sulphate Blanc fixe; magnesium and a silicate Talc; and alumina and silica China clay.

The following is a full scheme for the identification of the mineral matter added to paper.

1.—Reduce the paper to ash. If a coated paper remove as much as possible of the coating by treatment with warm water and a brush, and examine this separately from the body paper. Treat a small portion of the mineral matter in a test tube with dilute hydrochloric acid. If the ash is entirely or almost entirely soluble on warming probably only Pearl hardening or Satin white is present. In this case the addition of barium chloride to the solution will give a white precitate and the analysis need not be conducted further. If none or only a portion of the ash is soluble in the acid proceed as follows:—

2. Mix the ash with four or five times its weight of fusion mixture in a platinum crucible and fuse the mixture for half an hour at a good red heat, finally employing the blowpipe for some minutes. Allow the fused mass to cool and extract the contents of the crucible with boiling water. Filter.

The Reactions of the Colors Used in Paper.

The coloring matter in a colored paper may be either (1) a dyestuff, or (2) an inorganic pigment. The presence of a dyestuff may, as a rule, be detected by treatment of the paper with boiling spirits of wine which will extract a dye but remain uncolored by a pigment. Further, many dyestuffs upon treatment with acid or alkali have their color completely changed. If, therefore, the application of a drop of hydrochloric acid or of caustic soda changes a red colored paper to blue we are enabled to infer that a dyestuff is present.

Dyes may be either acid, basic, or substantive in character. If it is desired to determine to which of these classes a color belongs, the following procedure may be adopted. A good quantity of the colored paper is extracted first with alcohol and then with boiling water. The resulting extracts are mixed, evaporated to small bulk, and the coloring matter thrown out by saturating the solution with salt. The precipitated dye is filtered off and dissolved in as little water as possible. The solution thus obtained is treated with a reagent prepared by dissolving 25 gms. of tannin and 25 gms. sodium acetate in 250 c.c. of water. This reagent gives a precipitate with a basic color, but not with an acid dye. If no effect is produced with the tannin reagent the color may be a substantive or direct dyeing one. To test this dip a piece of white mercerised cotton into the color extract to which has been added a little sodium sulphate. If the cotton takes up the color the latter is a substantive dyestuff.

The pigments used in paper making are distinguished from dyestuffs by the fact that upon incineration of the paper containing them a colored ash is left behind. This statement must not be taken to mean that the original color of the paper, as in some instances decomposition of the color takes place upon incineration. Thus Prussian blue, which is ferro-cyanide of iron, is destroyed during incineration, leaving only a brown residue of oxide of iron. Again, in the case of Chrome yellow (lead chromate), in the presence of the carbonaceous matter of paper more or less change in the col-

...place upon incineration it being either more ... completely decolorized or else changed to a ... shade through reduction of the chromate to ... compound

...this paper may be colored either with smalts ul... or Prussian blue. Smalts being an expensive ...ot will only be found in very high-class ledger ...s and hand-made stock. Its tinctorial value is ... than that of ultramarine and it is thus chiefly ...in the production of light azure tints. The blue ...of both smalt and ultramarine is left unchanged ...meneration but whereas the former is highly ...tant to chemical action the latter is easily de... ...ed on treatment with dilute acid or even in some ...with alum. The alkaline sulphides upon which ...olor of ultramarine depends are split up by the ...with the evolution of sulphuretted hydrogen a ...with a strong odour of rotten eggs and which ...also the property of blackening a lead acetate test ... The presence of ultramarine in paper is thus ...detected by moistening the latter with a drop ...drochloric acid. Owing to the greenish shade of ...exhibited by ultramarine, papers colored with ...pigment are quite frequently topped with methyl ..., the combination producing a much finer shade ...olor than is obtainable with the pigment alone ...ust not be forgotten that so-called white papers ...ently contain a little blue coloring matter intro... ...d to counteract the natural yellowness of the pulp. ...writer had a case under his notice where a dis... ...as to the mill of origin of a white blotting was ...ed solely on the fact that the sample contained ...inute proportion of ultramarine.

...ussian blue is mainly employed in packing and ...ar papers. Owing to the sensitiveness of the ...ent to alkalies which destroy the blue colour with ...simultaneous formation of brown ferric oxide, ...sian blue is unsuitable for wall and other papers ...h are liable to come in contact with lime, etc. ...rs coloured with Prussian blue are also somewhat ...ptible to the action of light which has a slight ...g influence, but exhibit the phenomenon peculiar ...to pigment of having the intensity of their colour ...ored on being kept for some time in the dark.

...e detection of Prussian blue in paper depends on ...act that on treatment with caustic alkali cyanide ...ferro-cyanide of the alkali are formed, from which ...olor can be reformed by appropriate treatment. ...paper under examination is warmed with a little ...te soda which precipitates the iron and decolor... the blue. The solution is filtered and to the fil... ...are added a drop of ferric chloride and a crystal ...rrous sulphate. The whole is now heated to boil... ...and acidified with hydrochloric acid, when Prus... ...blue is reformed as a clear greenish-blue solu...

...e yellow and buff pigments are the Ochres and ...me yellow, of which the latter is much the more ...iant color. The Ochres being hydrated iron pig... ...s appear in the ash of paper with little or no ...ge. From the ash they may be identified by their ...ility in warm dilute hydrochloric acid the solu... ...giving, upon addition of a drop of ferro-prussiate ...otash, the characteristic blue coloration of Prus... ...blue. Chrome yellow, as previously stated, may ...t most completely decolorised during ignition, but ...is recognised in paper by its behaviour towards ...lution of sodium sulphide, a drop of the latter ...d on the paper causing the formation of a brown ...or black stain due to the production of lead sulphide.

The red and brown pigment colors are almost exclusively the Siennas and Umbers, all of which give the characteristic reaction for iron described under Ochres.

The most usual green pigments are Chrome greens, consisting of various shades of Chrome yellow as mixtures with Prussian blue and baryta. The color from this color is resulting from iron oxide reduced from the Prussian blue. The color is easily recognized in paper by the effect of a drop of sulphuretted acid, the acid decolorising the chrome yellow and leaving behind the Prussian blue which is resistant. The spot touched by acid, therefore, gradually becomes blue.

The Reactions of the Sizing Material.

Animal tub sizing consists as is well known, in the treatment of paper with a solution of gelatine in such a way as to ensure the absorption into the pores of the paper of as much gelatine as the paper maker feels the occasion justifies. Tub-sized papers of ordinary grades are usually room sized in addition, and in these cases the amount of gelatine present may be in extreme cases so small as to be almost non-existent.

Tub sizing is detected in paper by one or more of the following chemical reactions, viz.

1. A tub-sized paper upon being boiled with water for a few minutes, and the extract treated with a few drops of the tannic acid reagent previously described, causes the formation of a characteristic flocculent precipitate. This precipitate varies considerably, in colour being usually yellowish but quite frequently white and milky. The time taken to form is also variable, depending upon the quantity of gelatine present. This reaction is an extremely delicate one, it being possible to detect the presence of one part of gelatine in 20,000 parts of water, the solution becoming distinctly cloudy after standing half an hour. A paper, however, in which the reaction takes more than, say, half a minute to show itself can hardly be termed tub sized, but such papers are of common occurrence under this heading. The tannic acid test for tub sizing is not entirely conclusive, soluble starch which is frequently present in paper along with gelatine, also giving a precipitate with tannin. To obviate confusion in this respect several methods of conducting the test are advocated. Thus it is stated that the extraction of the gelatine can be conducted at a temperature below boiling, when starch, if present, will not go into solution. As a matter of fact, however, the absence of starch from the extract cannot be entirely depended upon. Another method is given for the precipitation of the starch with iodine as a blue compound which may be filtered off before testing gelatine, but experiments show that it is almost impossible entirely to remove starch in this way. The writer's method consists in the precipitation of starch as an insoluble barium compound with baryta water. The extract for this purpose has, of course, to be made with distilled water. After filtration any excess of baryta is precipitated with sodium sulphate and the solution finally neutralized with a little dilute sulphuric acid, after which the ordinary tannic acid test can be safely applied.

2.—Millon's reagent gives a pink coloration in tub sized papers upon dipping the latter into the solution and warming over the flame. The reaction, which depends upon the presence of albumin in the gelatine, is not a very delicate one and the paper needs watching as it is apt to become scorched in the process.

TAKING HOLD OF A NEW JOB

Taking hold of a new job is one of the most interesting events in a man's life. How to take hold of a new job is a matter of great importance. A great deal depends upon how a man starts in. A good start is worth everything to the would-be successful job-taker. It is either the making or the breaking down of his success. More men meet what, in the end, causes their finish, at the start of a new job, than at any other time. This is on account of the lack of diplomacy. It requires tact to start on a new job and have everything run smoothly. To some men it is an easy task. To another it is a big embarrassment. It is true that some "Tramp" overseer makes a fine start, but he is soon found out to be only cutting fancy figures on thin ice. He soon finds that skating on melting ice is too hot and dangerous for him, and he chases himself to colder regions. It is also true that many a good man, fully competent, makes a poor start, and meets the same uncalled-for fate. But, taking the average run of changes, good or bad, a good start will smooth over a great many difficulties. Many a man short of breath has made time for himself to grow up to the place by simply starting right, avoiding mistakes, and getting close to the hearts of the rank and file by creating good feeling.

What is a Good Start?

How shall a good start be made? This cannot be answered with one stroke of the pen. There are a great many "Don'ts" to take into consideration about the successful start. The first is don't talk unless absolutely necessary. Keep your tongue back of your teeth as long as you can, and as much as you can. And when you do open your mouth say something that cements good will. Many a man throws out a boomrang at the start that strikes back before nightfall. The new man loses sleep on the first night, and the game is lost. The next day, on the street, remarks like this may be heard, "Did you hear what he said," says the leader of an evil faction. "What did he say?" says two or three at one time. He said, "This is a slow town." "Ha, ha, ha," all laugh, and say "We'll speed 'er up for 'im, eh?" Before the day closes the whole mill village has the new man sized up, as the man who is "Too fast for these slow diggings," and he had lost prestige. The above is only to illustrate how the help await the first words or sayings.

When taking a new job, do not tell what you are going to do, what you have done, nor what ought to be done. Simply and quietly take up each task as it comes and say as little as possible and at the same time get business through. Great diplomacy needs to be exercised so as to keep the production coming along, hold the quality up, and not have the cost run up too much. Taking a new job is not like taking a fortress—the help are not prisoners, and are not obliged to work for you.

The thing that will kill opposition very quickly is to **get acquainted with the help first.** If there is going to be a ball game, wedding, funeral, or celebration, take some interest in it. Get close to the hearts of the people; in other words, be helpful outside as well as inside. This is what counts. Too many men are overanxious and too serious about the inside results, and too forgetful of the humanitarian outer things.

It makes some difference as to **what circumstances brings the new man to fill the old job**—that is, whether the man who is succeeded was discharged, or resigned, or died. Again as to whether the conditions in the plant are in good shape or distressed. It makes a difference if the man who is succeeded was a long termer or not. It is always very hard to succeed a man who has held a job a long time, because of his prestige. Everything has been shaped and molded his way. Think well before taking his place. All the help have been trained to follow this man closely, and it will be very hard to change any of this, even if necessary. It is best not to try to make changes at first. Let this take care of itself for the time being. It will all straighten itself out if the new boss is prudent, and has foresight and patience.

When succeeding a discharged man, it makes a difference as to whether the help were with him or not. In any case, do not antagonize nor invite criticism. Endeavor to do some good turns here and there as soon as possible. A few curious hands who would like to start something will soon test the situation by asking out sick. Sympathize with them and let them out. Tell each one to take their time and not to hurry back, although you will miss their good work. This may cost some production and run the cost up a little, but it is the cheapest way out of the dilemma. They will meekly return soon, and the chances are that all of the difference will be won over and everything bad die a natural death. In any case, never run down your predecessor to anybody. If a valuable hand mourns the discharged man, find something to commend about his work to that hand. Something can always be found to commend about anybody. And about the man who resigned or died. Find a great deal to commend on every hand. Don't deluge the place with your preferences. Don't throw a challenge under everyone's nose you meet. The foolish revolutionizer does this, but he finds the chip knocked off of his shoulder at every turn.

There is a good deal in adapting one's self to the new situation in the broadest sense. Find out from the management just what the duties of the new place call for, and where the lines are drawn. Learn beforehand what peculiarities must be reckoned with. Adjust yourself in connection with other's equals around the place. To many men the only happy time the job ever brought them was the day they hired out. After that they have always longed for the end to come. The sooner it came the better they liked it at almost any cost.

In making a success of a new job a great deal devolves upon both parties, the employer and the man taking the job. Don't skid into a new place. The points at issue are many, and when properly drawn out amount to the following parallels:—

1.—THE MAN.
2.—Wants to change.
3.—Is this particular job wanted.

From the Canadian Textile Journal.

4.—Can he fill the position.
5.—Is the pay satisfactory.
6.—Will he take the job.
7.—Conveniences wanted.

1.—The EMPLOYER.
2.—Man wanted.
3.—Is this particular man wanted.
4.—Will they let the man fill the position.
5.—Are they willing to pay for the man.
6.—Job is offered.
7.—Will they make him comfortable.

If this scale of prudence meshes in all right, the way for a good start will be fairly well paved. But before the man decides to change places and accepts an offer, he should draw up another code for his own good. This is the code of comparative advantages. There will be two columns of these. One will be the list of advantages which he now has for himself and family, where he now lives, and the other column will show the advantages he would have if he took the proffered position.

Present Situation in Oldville.

1.—Superintendent's position.
2.—Smaller salary.
3.—Old mill.
4.—Fair house, moderate conveniences.
5.—Nice neighbors.
6.—No vacation.
7.—Gas light.
8.—No Christmas present.
9.—Poor help.
10.—Small town.
11.—Poor churches and schools.
12.—Too much in the public eye.
13.—Nearer relatives.
14.—Healthier.
15.—Beautiful flower garden, lawns and vegetable garden.
16.—Nearer a large city.
17.—Free school books.
18.—Good laundry.
19.—Fire places.
20.—Large list of friends.
21.—Sure he can stay long as he pleases.

Proposed Situation in Newville.

1.—Agent's position.
2.—More salary.
3.—New mill.
4.—Nice new house with all conveniences.
5.—No neighbors.
6.—Annual vacation.
7.—Electric light.
8.—Annual Christmas present.
9.—Better class of help.
10.—Larger town.
11.—Good churches and schools.
12.—Less in the public eye.
13.—Among strangers.
14.—Not so healthy.
15.—No grounds.
16.—Not near any large city.
17.—No free school books.
18.—Laundry not so good.
19.—No fire places.
20.—No friends.
21.—How long he can stay is uncertain.

If, after weighing all of the pros and cons as outlined, the man decides to change. Doubtless his start will be a mighty good one. He will like his new abode more and more, and his principals will hang on to him at most any price. He counted the cost well beforehand.

It should be recognized that it requires as good judgment to make a change of position as it does to operate the job afterwards. A good start makes a good impression. Don't quit a sure thing for guesswork. Know what you are doing. Some men go from job to job so rapidly that they do not have time to unpack their trunk. Put on your anti-skids and choose wisely. It is not enough to know why you want to change and what it is that you want. It is better to know when to change and how much you can afford to change.

Ottawa Notes

Ottawa, Ont., August 10, 1915.

As a result of the expiration of the tax exemption granted to it fifteen years ago, the E. B. Eddy Co. will have to pay $20,000 more per year to the Hull civic treasury from now on. During the past fifteen years the firm paid taxes only on a fixed valuation of $400,000, whereas from now on it will be taxed on a valuatin of over $2,000,000. The exemption to the Eddy Company was given on December 16, 1900, following the big conflagration of that year, and it was thought that the period of exemption would not expire until December. On investigation of the contract, however, it was discovered that the period of exemption expired on May 1 last.

The water in the Ottawa River has been steadily dropping during the past few weeks. It is confidently predicted, however, that it will not be nearly so low as was the case last summer, when thousands of dollars were lost by local pulp and paper industries, which had to import pulp to fill their demands. Both the Eddy and Booth plants are operating near capacity, and expect to do so while the market remains favorable.

The pulp and paper companies have sent their men into the woods during the past two weeks to cut timber and pulpwood for the 1915 season. A number of experienced lumberjacks have enlisted for overseas service, the 77th regiment, newly formed in this city, including a large number of these hardy men. There is no lack of men to take their places, however. Wages are lower this season than last and range from $12 to $22 per month with board, as compared with $16 to $30 last year, even though last year's wage level was considered low. The demand, on account of the curtailment of operations this year, is less for this class of labor.

Seven parties have been sent to the prairie provinces this summer by the Dominion Forestry Branch, and are now engaged in forest exploration work there. Besides estimating the amount of timber and pulpwood with which the areas in question are clothed, they will endeavor to ascertain all large areas of non-agricultural land which may be used in future to produce commercial timber or pulpwood.

UNITED STATES NOTES

The Cylinder Paper Company, of Watertown, N.Y., is in the hands of receivers appointed by Judge Ray. It is alleged the company owes $100,000 with nominal assets of $42,000 and that it has made preferential payments before and after the company made a written admission of insolvency.

Michigan paper mill owners are rejoicing over the freedom of accidents that have been experienced in the state for many months past. The "safety first" campaign originated last spring at Kalamazoo is certainly bearing fruit, as there has not been a single serious accident in many months. Nearly all of the mills have inaugurated "safety first" campaigns, and in some of the mills there are regular committees among the men who have charge of this feature.

Commencing Saturday, July 30, the Cumberland Mills of S. D. & Company, at Westbrook, Me., began to run on a five days' schedule for the present. This somewhat unusual proceeding caused much interest in the community, and many surmises as to the cause of the shutdown. As a matter of fact the mills have been overhauling all their machines since the first of the year, lengthening and improving them, and, in one case replacing a machine by a new and considerably larger one, so that the daily capacity of the mills to-day is somewhat over 18 tons greater than it was on January 1.

The National Forests turned into the U. S. Treasury during the fiscal year ended June 30, 1915, nearly $2,500,000, an increase of more than $40,000 over the receipts of the previous year, according to a statement just issued by the Forest Service at Washington, D.C. The timber sales, which amounted to $1,164,000 yielded on account of the depressed condition of the lumber industry about $79,00 less than these of the previous fiscal year, but the gain was made possible by larger revenues from other sources.

General Appraiser Hay recently over-ruled a protest made by Felix Salomon and Co., to have wood pulp entered at the port of Portland, Me., declared free of duty. The protest was against the assessment of duty on certain wood pulp imported from Germany under the provisions of the act of 1909. It was claimed that by virtue of the favored-nation clause in the subsisting treaty between the United States and Germany and section 2 of the Canadian reciprocity act of July 26, 1911, the merchandise was entitled to free entry.

The Mount Holly Paper Mills, of Mount Holly Springs, Pa., has just been incorporated with a capital stock of $250,000.

The largest shipment of wood pulp to arrive at the port of New York during the past fortnight was consigned to the Tidewater Paper Mills Company, of Brooklyn. The shipment came from Nova Scotia, and consisted of 15,149 bales weighing 3,029 tons in all.

The International Paper Company is about ready to start the burning of oil, instead of coal in its boiler plant at Rumford, Me. Large storage plants are being constructed underneath the old coal trestle. A representative of the Texas Oil Company, from which the International will secure its oil in company with the International Paper Company's chief engineer, Mr. White, were in Rumford last week making final arrangements. It is estimated it will require from two to three cars of oil per day.

The water power rights and the main building of the manufacturing plant of the defunct Progressive Pulp and Paper Company in Plattsburg, N.Y., have been sold to the Adirondack Trust Company, of Saratoga Springs, for $112,500.

Managers of sulphite pulp mills, interested in digesters, will find valuable information on the subject in a pamphlet just issued by the Panzl Digester Lining Company, of Muskegon, Mich. The booklet explains the properties of composition linings and shows why their use results in the safe and continuous productive operation of the digesters in a pulp mill. Interesting reports and other data from expert chemists, are also contained in the booklet. A copy of this pamphlet will be sent on request to anyone who is interested in digester linings.

At the last meeting of the board of estimate and apportionment of Niagara Falls, N. Y., it was decided to include in the budget for 1916 $25,000 for the illumination of the Falls. In addition, $10,000 will be raised by popular subscription. Paul A. Schoolkopf, vice-president of the Cliff Paper Company there is prominent in the movement to have the falls illuminated. The proposition is to purchase the 48 projectors now in use at the Panama Pacific Exposition, and install them in that city. An effort is being made to interest the Ontario legislature in the project.

Officials at the Forest service think that because of the lack of the proper material in the east, paper and pulp mills will soon have to be erected in and about the Rocky Mountain region. It is said that the Rocky Mountains contain Engelmann spruce, white fir and lodgepole pine, all of which, according to experiments carried on by the Serice, are excellent paper power in the forests containing this timber. There are about eight million people in the inter-mountain states, officials at the Service say, without a single paper mill. They think that the difficulties raised by the European war would permit the development of the industry in the Rocky Mountain territory.

An addition will be built to the office of the Howard Paper Company, Urbana, Ohio. This information was given out recently by Lucien Howard, Secretary of the company, who states that the present office is much too small, and that the office force has been crowded for room for several months.

The following order, dated July 29, and signed by Philip T. Dodge, president of the International Paper Company has been issued to the department managers and mill superintendents. "The officers of this company believe it is a public duty at this time to encourage military training, and in order to enable employees enlisted in military organizations more readily to perform the usual summer camp service, it has been decided hereafter to grant leave of absence for this purpose with full pay, such absence to be in addition to any regular vacation; but in case pay is allowed by the state, the allowance by the company will be correspondingly reduced. Employees will be expected to produce proper evidence of the duration and terms of serice."

PULP AND PAPER NEWS

M. Granatstein and Sons, rag and paper stock dealers, Toronto, are erecting a six storey brick and steel addition to their warehouse at 482 Wellington St. West, Toronto, which will cost twenty thousand dollars.

Among new concerns, which have been chartered of late, are a large number which have wide powers, C. A. Spencer, Limited, of Montreal, share capital $150,000, is empowered to manufacture and deal in logs, lumber and timber as well as pulp, paper and other products. W. J. Trick Co., Limited, Oshawa, capital $250,000, has similar powers. Another incorporation of interest is the Central Press Agency, Limited, Toronto, capital $100,000, to collect, sell and deal in news, and to carry on the business of general printers, engravers, bookbinders, etc. Auger and Son, Limited, of Quebec City, capital $100,000, are chartered to deal in lumber, logs, timber and pulp wood, etc. J. H. Wallace and Co., Limited, of Montreal, capital $20,000, will carry on the business of engineers of every description, and act as architects and contractors for the erection and construction of public and private works. This concern is a branch of the well known New York firm of Joseph H. Wallace and Co., pulp and paper mill engineers, who have erected a number of plants in Canada for pulp and paper mill companies.

F. C. H. Tyron, head accountant of the Canada Paper Co., Windsor Mills, Que., has enlisted for foreign service, and has been granted a commission as lieutenant in the new Highland Regiment of Montreal under Lieut.-Col. Peers Davidson. Lieut. Tyron served seven years with the Fifth Dorsets in the Old Country, and has had considerable military experience. Corporal John Donovan, late with McFarlane, Son and Hodgson, Montreal, has joined the Victoria Rifles at Valcartier. He served a year with the Yeomanry in Scotland, and is a cousin of H. B. Donovan, sales manager of the Canada Paper Co.

P. G. McNeil, of Latchford, Ont., has bought the right to cut several lots of timber in the township of Auld, District of Timiskaming, his tender being the highest, and accepted by the Ontario Government. For the right to cut red and white pine he will pay $5.55 per thousand feet bonus and $2 dues; for Jack Pine and spruce, $2.05 per thousand feet bonus and $2 dues; for pulp wood 65 cents a cord bonus, and 40 cents a cord dues; ties 8 cents each bonus, and 5 cents dues. These prices are in addition to the ground rent of $5 per square mile. The license is renewable annually until April, 1918, after which the remaining timber revents to the Crown.

September 2, 3 and 4 will be busy days with the news and paper men in Toronto for, on the first two days, the annual meeting of the Canadian Press Association will be held. It will be the fifty-seventh annual gathering, and a fine programme has been arranged. Out of the original charter members of the association there is only one living, and he is Sir Mackenzie Bowell, proprietor of the Belleville Intelligencer, who is in his ninety-second year, and able to take a trip across the continent, at the present time being in Vancouver. Identied with the Belleville Intelligencer for the long period of eighty-two years, he has a record unequalled in the life of any man in America in connection with one paper. Another outstanding feature is that Sir Mackenzie Bowell is still a working journalist and, when at home, is at his desk every day writing editorials. Among the outside speakers at the convention will be Wm. A. Thomson, Director of the Bureau of Advertising, American Newspaper Publishers' Association, New York; Dr. Talcott Williams, Director of Journalism, Columbia University, New York, and E. K. Whiting, manager of the Journal-Chronicle, Owatonna, Minn. The directrs of the Canadian National Exhibition have appointed Saturday, Sept. 4 "Press Day," and have invited ex-President Theodore Roosevelt to be a guest at the luncheon. It is expected that the distinguished American will accept.

Dyestuffs will soon be manufactured in Canada to relieve the situation. The Berman Dye Works, Limited, of Montreal, and the Weedon Chemical Co., of Sherbrooke, Que., have been incorporated to carry on the business of dyers to distill wood, and produce all sorts of chemical products.

A campaign for machine guns has been undertaken among members of the Canadian pulp and paper industry. Already three guns have been promised by prominent manufacturers, and strong hopes are entertained by Mr. C. Howard Smith, who has been devoting his energies to a canvass of the industry that several more will be forthcoming.

T. E. Gain, Vice President of the Ratcliff Paper Co., Limited, Toronto, has been spending a holiday at Georgian Bay points. By an error in the last issue, it was stated that J. F. Gain was Vice President of the Ratcliff Paper Co. This should have read T. E. Gain, who has been identified with the company a number of years.

The Provincial Paper Mills Co., Limited, Toronto, recently shipped another large consignment of bond paper to Buenos Aires, Argentina, making the second shipment that has gone forward during the past few weeks. The company are raising the side walls of their paper machine room at Mille Roches, Ont., and are putting on a steel trussed roof. Some experiments have been carried on in the Barber plant at Georgetown, Ont., in the making of light weight blotting paper with good success. The Provincial Paper Mills people may branch out quite extensively in this line.

A. F. Bradley and D. Cleary, who have been employed by the Spanish River Pulp and Paper Co., as paper makers, at Espanola, Ont., have joined the 60th Regiment for foreign service. The company have promised to keep their places open for them until after the war.

Thos. B. Gord is the third son of J. Ford, of the well-known firm of that to enlist for Overseas Service. He is at present in training at Valcartier.

The Markets

CANADIAN MARKETS

Summer dullness prevails throughout the paper industry, and there are no changes in conditions worth special attention. News print mills continue to be fairly busy, and a very satisfactory export trade is being done, but home consumption has fallen off somewhat. One action, which is viewed with considerable favor by the exporting plants, is that the French Government has removed the duty on print paper for the period of the war, as prices had reached too high a level to make the issues of several dailies possible without heavy loss. It is expected that some Canadian plants will now develop business with France, which country, heretofore, has secured very little print paper from the Dominion. The only difficulty is in the way of securing adequate shipping conveniences, although shipments are going on constantly to Great Britain, (where the size of the daily newspapers has recently been reduced, due to the falling off in advertising patronage), South Africa and Australia.

A leading member of the trade stated this week that, while the number of pages in many Canadian weekly and daily publications had been reduced, up to the present month, records showed consumption to be about the same as last year, owing to the fact that the dailies especially, by reason of the war, have greatly increased their circulation, some of them issuing as high as twenty and twenty-five thousand copies a day more than a year ago.

In book, bond and writing papers the mills are running along, but are not rushed. Water conditions are very fair on account of recent heavy rains. One Canadian plant is shipping considerable bond paper to South America. Orders are for the most part limited in quantity and stocks in the hands of printers are small, but, with the advent of fall business, it is expected that purchases will be considerably augmented.

The recent advance in postage has not been without its effect on the envelope manufacturers. Correspondence has fallen off considerably, as the postal returns show, and envelope plants are working only about two-thirds capacity in most cases. Coating mills are fairly busy. At present there is no distinct demand for any grade of paper, and jobbers report the prevailing quietness is not unusual at this season.

Kraft is gradually but surely displacing manila papers, and to a certain extent fibre. The market has of late been disturbed by the mills offering job stocks of wrappings at low prices but it is understood that more discretion will be used in selling from this out so that conditions will not be upset on the part of the mills. In paper bags, after the recent increase in prices, there has been somewhat of a slump, and orders have largely been of a sorting character.

Tissues and toilet papers are holding their own very well, and the mills producing specialties are having a very good run of orders. Plants making very high priced writing papers, owing to the shutting off of foreign supplies, are doing very well. In the chemical fibres there has been a firming up. A growing shortage exists in foreign supplies, and less than half the amount of foreign cellulose, which was on the docks a few months ago, is now there. The Scandinavian manufacturers of sulphite are disposing of practically all their product in European markets at a good figure. Importers feel, if the war is continued throughout the coming winter, coupled with the steadfastly diminishing consignments sent across the ocean, that the figure for sulphite will reach an abnormal level. Shortage of raw materials has also minimized the output of pulp in Norway and Sweden, and the outlook, to say the least, is full of uncertainty, and fraught with much speculation. Canadian plants are well sold up with little stock on hand. In ground wood prices are stationary and the demand rather light. Water conditions are holding out well across the line, and little trading is being done except on contract.

In the rag and paper stock market very little change is noted, and the market continues dull. Mixed papers have gone up a trifle, while roofing stock is firmer. There are no other features of interest to record.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.90 at mill, in carload lots.
News (sheets), $1.95 to $2.00 at mill, in carload lots.
Book papers (ton lots), 4.25 c. up
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.25 to $3.75.
Manila, B., $2.25 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.10 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.25 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $22, delivered.
Sulphite (unbleached), $39 to $44, del. in Canada.
Sulphite (unbleached), $40 to $45, delivered in U. S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.10.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 40c
White blanks, $1.00.

No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.55.
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Tinted News, 32½c.
Over issues, 40c.
No. 1 cleaned mixed paper, 25c.
Old white cotton, $1.75.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.20.
Black linings, $1.25.
New light flannelettes, $3.75.
Ordinary satinets, 95c.
Flock, $1.05.
Tailor rags, 85c.
Blue overall cuttings, 3.37½.
Manila rope, 2½.
No. 1 burlap bagging, $1.00.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.

Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.

No. 1 Book, 5¼c to 5¾c per lb.

No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.

No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.

Writings, 5c to 7½c.

Sulphite Bond, 6½c to 8½c.

Writing Manila, 5c.

Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.

Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.

B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.

No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.

No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.

Kraft, $3.75 to $5.00.

Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.

Fibre, $2.75 to $3.50.

Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.

News quality, $39 to $40 per ton.

Bleached sulphite, $54 to $59 per ton.

Kraft Pulp, $39 to $40.

Ground wood, $20 to $23, delivered in United States.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine.)

New York, N.Y., August 11, 1915.

Grinders of ground wood pulp have been very much disappointed during the past few weeks. They had loked forward to dry weather, and the consequent diminution in the water supply throughout the State which would not make it possible for the news mills to grind their own pulp. But the unusually late heavy rainfalls were contrary to expectations and the results were not strengthening to the market. Very little inquiry is being received, and it is apparent that the paper mills are looking out for their own requirements in ground pulp. Considerable stress is also placed on the fact that during the strike, which is still in progress at Watertown, the grinding machines were kept in operation when the paper-making apparatus was compelled to be idle. Current prices are not firm. The future of the market is dependent, largely, on weather conditions.

Newsprint has become considerably firmer during the last fortnight. Practically no shading of prices is reported, and it is understood that there is little likelihood of any such occurrences for some time. The first signs of stability were noticed in the market shortly after the strike at Watertown was declared. Considerable tonnage was removed, for a while, and manufacturers immediately hardened their prices. Although the labor troubles have not yet been settled, the mill owners claim that they have been able to get enough help together to enable them to operate most of their machines at a fairly satisfactory capacity. A crisis was passed a little over a week ago when the International Paper Company renewed its old working agreement with the labor unions. For more than three months there has been a great deal of negotiation in progress to obtain for the machinists in the International plants, the 8-hour day. As this request was refused, it appeared, for some time, that the paper-makers would go out on strike in sympathy with the mechanics. Such a strike would have created much havoc in this market. However, the signing of the agreement makes any action of this sort impossible.

There has been very little movement of chemical wood pulp recently. The mills are not operating at full capacity, and are buying only to cater to their immediate needs. The general attitude on the part of the domestic paper mills appears to the importer to be careless for, at the present time, there is not much interest being shown in stocks. In the meantime, the market is growing firmer and there is less and less tendency manifested by the importers to shade prices. On the contrary, they are holding firm to the advancing prices, confident that it will not be long before they will be compelled to come out and purchase stock at the high figures. Reports from abroad are bullish. It seems almost impossible to contract for pulp at any price, for the Scandinavian production is said to be monopolized by England, France, Spain and Italy. These countries are each in dire need of large quantities of chemical pulp and are paying very high prices in order to continue their option. The reported embargo on coal from England will work more hardship on the foreign pulp mills. They will have but one resource in seeking fuel, and that will be to come to the United States. To ship coal from this country to Sweden or Norway under the existing high ocean freight and insurance rates would mean a greatly added expense. Considerable complaint is also made of the difficulties in securing sulphur. It has recently

been stated that England is holding tight on her bleaching powder so that manufacturers of bleached sulphite are uncertain about future supplies of this chemical. Easy bleaching is not plentiful, and can only be had at good prices. Bleached and unbleached are both firm. While imports have been fairly well, it is understood that most of this stock is coming over on old contracts and that it is going directly into consumption. From this, it is right to assume that the available stocks on the docks are diminishing. Krafts are very firm. Sulphates are acting in sympathy with the other grades.

Rags continue poor, both in demand and price. The writing mills, who consume that largest portion of this stock are operating at about only 50 to 60 per cent, which fact has, of course, reflected emphatically on this market. Also, some mills have taken advantage of the season to shut down temporarily for repairs. Just how well stocked the mills are, is not quite certain, although it is estimated that they have not enough to suffice for a reasonably long period. However, it is sure that no interest is being displayed in the condition of the market. There is comparatively little accumulations in this country and imports are far from satisfactory. It is hardly possible that, in the event of a sudden return to normal business, there would be sufficient rags to meet the general needs. Dealers are confident that the Fall will bring about a number of changes for the better. Linens are in good demand just now, but they are somewhat scarce and hard to obtain. Bagging is firm and advancing. There is a general scarcity for all of these grades, which combined with a good demand from concerns outside of the paper industry, has sent the quotations up rapidly. Gunny is brisk. Bright and sound bagging are selling well, and give promise of showing to better advantage. Manila rope is active and strong.

Waste papers are dull and lifeless. No tendency whatsoever is being shown by this market to make any improvement. Packers complain that it is almost impossible to do business at a profit, at present. They are compelled to go out and take very low prices, so that they will be able to keep their stock in circulation. The inactivity of the board mills is largely responsible for this state of affairs. Then, again, the weak state of the board market has been reflecting strongly on old waste papers. Prices have not changed. Collections have been rather poor, owing to the fact that the printers and the binders have been feeling the effects of the dull summer season.

While there has been no apparent changes in the paper market, the trade is growing more and more confident that the crisis has been passed and that better conditions are in store. At present, there is no real activity of any sort. Although the mills report an improvement, they can hardly be considered to be operating on a good basis, as yet. The month of July has been fairly satisfactory and compares favorably with the same period of last year. Jobbers claim that there is good cause for optimism, and assert that they have had only to bear their usual mid-summer decrease in volume.

Tissue papers have tried unsuccessfully to strengthen on the market. There are so many mills selling at the greatly reduced prices that it is difficult to obtain an order unless an inducement is made. Several manufacturers are reported to be holding firm to the old prices. With these as a backing, it is thought an effort will be made to restore the full equilibrium of the market. Whites and manilas are in fair demand and show prospects of improvement. Colors are still firm and hard to obtain. Manilas and fibres are of little consequence. With the exception of the better grades of manilas, they are being forced at low prices and are said to be actually lifeless. Much the same may be said of krafts. With the market for foreign kraft papers largely shut out, it was thought that domestic stock would improve in proportion. But such does not appear to have been the case, for there is no demand for krafts. Paper bags are not showing much life. The tone of the market is firm, but there is no volume, to speak of. Evidently the jobbers are still stocked with the goods bought during the recent break. Book papers have been rather dull. However, much satisfaction is to be obtained from the fact that there has been a noticeable decrease in the amount of cutting and prices reported. It is understood that the gradual increase in magazine advertising is beginning to be felt in this market. The outlook for boards is uncertain. There is little activity in this field, and prices are so low as to cause somewhat of a general depression.

Side runs are very firm and seem to be strengthening. Quotations have been withdrawn, and an advance is expected. Since the start of the strike at Watertown, there has been a noted scarcity. It is understood that the manufacturers are doing as little as possible with side runs.

(Special to Pulp and Paper Magazine.)

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., $1.80 to $2.00, delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.60 to 2.90, ex dock, N.Y.
Easy Bleaching, impt., 2.10 to 2.25c, ex dock, N.Y.
Easy Bleaching Pulp from 2.15c to 2.20 to 2.10c to 2.25c.
Unbleached sulphate, impt. 1.80c to 2c, ex dock, N.Y.
Bleached sulphate, impt., 2.75c to 2.85c, ex dock, N.Y.
Kraft Pulp, $1.85 to $1.95

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

A WOOD WASTE EXCHANGE.

The United States Forest Service has inaugurated a Wood Waste Exchange, through which it puts manufacturers of lumber having small pieces left over, in touch with consuming industries of one kind and another, to the end of using up all the wood which might otherwise go to waste.

To date 147 mills and factories, having waste materials for sale, have applied for the privileges of the Exchange, while 76 other wood-using concerns have asked to be put on the list as desiring to purchase waste of various species and dimensions.

OCEAN FALLS TO RE-OPEN.

Plans have recently been formulated, and are almost matured, for the re-opening of the great pulp plant at Ocean Falls. The continuance of the European war has created an exceptional demand in Europe for paper. Germany was the greatest source of supply, shipping about 90 per cent of the paper used in England, as well as a large quantity to other countries, but has been eliminated by the blockade of the British Navy, whilst the opening of the Panama Canal has made possible a great reduction in freight rates, and time of delivery.

As a result of this new position of affairs, the Ocean Falls Company is to be re-organized as the Pacific Mills, Limited. It is proposed not only to work day and night to its capacity, but to instal further plant, and thus increase the output.

Capital for the work is to be supplied by Fleishhacker Bros. & Johnson, whose interests control a great part of the output of pulp and paper on the Pacific Coast.

TENDERS FOR PULPWOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway west of Lac Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council, for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near that territory, and to manufacture the wood into paper in the Province of Ontario — the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,
Minister of Lands, Forests and Mines, Toronto, June 5th, 1915.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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The Eastern Rate Case

The Eastern Freight Rate Case has been sub judice for several weeks, and the decision of the Board of Railway Commissioners may be expected at any time.

Hearings have been held at various points since the case opened on March 1st, those in which this industry was chiefly interested being at Ottawa on April 14-15 and May 10-11, the proceedings relating directly to pulp and paper being printed and distributed by the Association. The final hearing was at Ottawa on June 29-30, when counsel for the railroads presented arguments in support of their application, and Mr. J. F. Orde, K.C., special counsel representing the Dominion Government spoke briefly. Very little was said in rebuttal at this session by those opposing the application.

The main argument of the railroads to justify application for an increase in freight rates is that cost of operation has been increasing steadily in recent years as result of higher cost of material, labor, etc., and that net operating revenue is not sufficient to pay a reasonable return to stockholders. This broad statement invites analysis and criticism.

Under normal conditions the admitted increase in cost of labor and material to the railroads should be more than off-set by the increase in volume of business, and greater efficiency in equipment, which reduces the cost of handling. As every shipper knows, the railroads are constantly increasing the capacity of their equipment and demanding greater minimum loading on the part of shippers. This, with the increased hauling capacity of motive power, is logically with the object of reducing the cost of handling per ton mile and per car mile.

The principal cause of the railroads' financial difficulties during the past eighteen months is the serious commercial depression which began to develop early last year, and was greatly accentuated by the war. Owing to the comparative suddenness of the general dislocation of business the railroads could not readily readjust themselves to the new conditions, and for the greater part of the year 1914 they maintained an organization based on the previous year's traffic, which meant that the percentage of cost of operation to the gross revenue was greatly in excess of normal. Since late in the fall the railroads have materially reduced staffs, cut down train service, and effected other economies, which have brought down cost of operation to a point more compatible with the decrease in revenue, so that the figures submitted by the railroads showing results of their 1914 operations cannot consistently be considered as a fair representation of conditions.

It is obvious to those who have kept in touch with railroad matters during recent years that there are factors other than depression in business, which have contributed to their financial troubles, one of the principal causes being the unnecessary and unwarranted construction of parallel lines for competitive purposes, particularly in the Province of Ontario. Millions of dollars have been so expended without a relative increase in revenue. A conspicuous example is the situation between Montreal and Toronto, a large part of this territory being served by three parallel lines, while the older road was well able to handle all of the business offered. It is hardly consistent to expect the public to pay additional revenue in the way of unreasonable freight rates to the railroads to help them out of difficulties resulting from reckless and unjustifiable expenditure.

The application of the railroads for an increase in freight rates is in other respects illogical and inconsistent. The presentation of the case was handled almost exclusively by the Canadian Pacific and Grand Trunk Railways, the Canadian Northern stating simply that their need of more revenue was well known. The Chairman of the Commission intimated at one of the hearings that the decision of the Board would not be predicated on the requirements of the Canadian Northern.

The financial statement of the Canadian Pacific for the fiscal year ending June 30th reveals that notwithstanding an enormous decrease in business, the net revenue of the road was sufficient to pay the regular dividends, aggregating 10 per cent, and leave a comfortable surplus. This surely is convincing evidence that no financial assistance is required by that line.

The Grand Trunk probably has more justification than any other road for asking an increase in freight rates. Its revenues have been severely cut into through the paralleling of its principal lines by other companies. That road is also unfortunately handicapped through its ownership of unprofitable lines in the United States, but it certainly is not reasonable to expect Canadian shippers to pay exorbitant rates in order to make up the loss incurred in operation of American lines.

Admitting for argument the contention that it would be for the general benefit of the country to provide some measure of relief for one or more Canadian roads, the method proposed is unfair and inequitable, as it imposes the burden on the shipper of freight exclusively. No serious attempt has been made to show that existing freight rates are too low, but freight traffic has been selected as the most susceptible to exploitation.

No suggestion was offered that possibly other sources of revenue might or should be augmented. Is the Government paying enough for the handling of mails? Do the Express Companies pay the railroads sufficient for the handling of their business? Why should the railroads be compelled by law to furnish free transportation to Members of Parliament and Government officials? Do the railroads impose a charge commensurate with the service for the movement of private cars used by members of the Government, or officials of other lines? The man who "pays the freight" is justified in asking why freight traffic alone should be singled out to shoulder the burden.

With the exception of the Canadian Pacific and Grand Trunk, none of the numerous railroads, parties to the application, made any effort to prove the "necessity" of additional revenue. It is obvious that some of them, at least, could not do so.

Several lines operated in Eastern Canada are owned by, or subsidiary to, foreign corporations, some of which, such as the Pere Marquette and Wabash, being practically bankrupt.

The proposition of the Canadian roads is that in order to assist one or two lines that may be able to prove "necessity," the public must contribute proportionately to all lines, notwithstanding that this would mean that the aggregate would amount to several times that actually necessary. The Canadian shipper is also asked to contribute additional revenue to foreign owned or controlled lines, which would be used to augment the depleted finances of the controlling companies. The fact that existing rates on the Canadian traffic of these lines are materially higher than those prevailing in the territory served by the controlling companies, is entirely ignored.

* * *

The request of the roads, particularly coming at the time it did, suggests that the word "opportunity" might properly be substituted for "necessity" in their application. For several years there has been an increasing tendency towards restrictive (railroad) legislation in the United States, particularly by legislatures of individual States—doubtless a great deal of it onerous and unreasonable. This resulted in the railroads combining in a skillfully planned campaign to create a reversal of public opinion, obviously calculated to influence the Interstate Commerce Commission to favorably consider the requests of the railroads for advances in freight rates, which, if allowed, would have produced enormous increases in railroad revenues. The campaign of the railroads was carried to such extremes in the apparent attempt to stampede the public as to almost precipitate a financial panic. The partial success of their efforts was reflected in the five per cent. case.

It is difficult to avoid the inference that the Canadian roads, encouraged by the success of the United States lines, decided that this was an opportune time to augment their revenues at the expense of the Canadian manufacturer and shipper. The Canadian roads, however, did not have the justification of the United States roads, as there has been a conspicuous absence of radical or unreasonable regulation of railroad operations on the part of the Canadian Railway Commission.

The recent decisions of the Interstate Commerce Commission in the "Western Rate Case" and the "Anthracite Coal Case" indicate that a logical reaction has developed in the United States, and it may now be expected that rate questions will be adjusted on their merits with fairness and justice to all concerned. It is fortunate for both shippers and railroads that the Canadian Railway Commission is so constituted as to be absolutely independent of the influence of any special interest, no matter how powerful it may be.

* * *

The evidence submitted in behalf of the pulp and paper industry demonstrated that the average revenue

to the railroads from the principal commodities shipped is in excess of that obtained from any similar group of commodities which could be fairly compared as analogous from a traffic standpoint, and is radically in excess of the generally average on all traffic; further, that rates in Canada are much higher than obtain on the lines in the United States. The railroads made no attempt to disprove these statements.

This industry is already paying the railroads approximately $140,000 a year additional revenue as result of the 5 per cent. increase in international rates, of which Canadian roads benefit to the extent of 40 per cent at least. The proposed increase would mean an additional burden of $200,000 per annum on this industry. There is no class of traffic of similar volume and value which loads as heavy per car, yields as great an average revenue, or is handled at less cost by the railroads than the principal commodities of this industry.

One of the arguments of the railroads was that they had been unable to advance the charges for their service relatively with the increased cost of operation, while the manufacturer could adjust his prices to meet the increase in cost of production. It was proved that so far as this industry is concerned, while the cost of production is steadily increasing, prices obtained for paper and pulp are lower now than at any time during the past five years.

The public is seriously handicapped in combating a case of this kind from lack of unity and organization, there naturally being more or less diversity of opinion as it affects different interests and localities. Some interests indicated a willingness to concede an advance in freight rates, almost irrespective of the merits of the railroads' application. It is readily understood that it is a simple matter to increase the selling price of such commodities as sugar or iron and steel by a fraction of a cent a pound, which would much more than recompense the manufacturer for any additional freight he might pay. It is equally obvious that it would be impracticable for the pulp and paper manufacturer to similarly protect himself.

It may be remarked in passing that the action of the Government was disappointing to a great many. At the first hearing Mr. Orde introduced himself as representing the Dominion Government and the public, announcing that his attitude at that time was in opposition to the application. The public was justified in assuming that it would have the moral support, if not the actual co-operation of the Government, in opposing the railroads' application, but Mr. Orde took very little part in subsequent proceedings, and his final address was decidedly non-commital. We feel certain that had it not been for the impression conveyed by Mr. Orde at the first hearing, as to the probable attitude of the Government, the public would have organized and presented a much more vigorous defence of their interests.

A review of the evidence and arguments submitted by the railroads confirms the opinion that the application is not only inconsistent and illogical, but was prepared without reasonable consideration of the subject as a whole.

The more closely the question is studied the more apparent it is that it is one for the Dominion Government, rather than the Railway Commission, to deal with. If it be found that one or more roads should be given financial assistance the Government should devise some method of providing it, which will be more equitable and consistent than the one proposed.

An Announcement

Since our advent to the industry which this periodical serves, we have been exceedingly fortunate in the selection of editors. This expression is not actuated by the very cordial relations that have always existed between the management of our company and these men; but is based upon what has been accomplished by them for the Industry and for the Magazine during their tenure of office.

During Mr. McIntyre's editorship, the Pulp and Paper Association was formed, the Forest Product Laboratories established and the Magazine enlarged and strengthened. In turn, he was Secretary of the first, Director of the second, and always Editor of the third, in the best and highest sense of the word. He left our employment because of the fields for larger things which opened before him. Mr. Campbell, who is now leaving us for the same reason, took up the work of the Magazine and of the Association where Mr. McIntyre left off, and has most ably and with every satisfaction to all concerned developed and strengthened both.

It is true that this work could not have been done by either of these gentlemen had they not had the excellent support given by those engaged in the industry of pulp and paper making. Here is where their great strength lies. They have the ability to lead and the good judgment to serve. These must always be the qualities that characterize the capable editor of such a technical and trade publication as the Pulp and Paper Magazine. Their policy must always be guided by the best interests of the industry, not as they conceive them to be, but as they are indicated by the industry itself.

Our difficulty lies in the fact that we must continue to pick the best men for this work, knowing at the same time that the more efficient the man proves himself to be, the sooner we will lose him. But this process enriches the industry, which after all is the only legitimate justification for the existence of the Pulp and Paper Magazine.

We wish Mr. Campbell every success in his new work.

J. J. HARPELL, President,
Industrial & Educational Press.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action, Feb. 28th, 1915.
WM. SMITH.
WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
GEO. ALBERT BROWN.
C. V. PERRY.
Sergt.-Major E. C. MORRIS.

Bird and Son.

JAMES BOATH.
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
..ut. GLIDDEN CAMPBELL.

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford and Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.
..S. FORD.

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G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. AMY, Jr., killed 31st May.
E. LEDGER.
A. BERNIER.
H. A. MOAT.
J. C. EAGLES.
J. HOOD.
S. HARTLEY.
G. LANE.
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HERB. PRYKE.
JACK CALLAGHAN.
JACK RAY.

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Montrose Division.

H. HALLAM.
J. HURLEY.
W. TAPP.
F. TROWBRIDGE.
MIKE CORTELLEJA.
CHARLES GASPRE.

St. Lawrence Division.

SANDY BEDFORD.
ERNEST BEDFORD.
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JOE DEMEREST.
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A. J. LOCK—"D" Company, 52nd Battalion, C.E.F.
E. H. TOYNE—"D" Company, 52nd Battalion, C.E.F.
Sergt. J. JOHNSON—"D" Company, 52nd Battalion, C.E.F.
LESTER L. LEARMONTH — "D" Company, 14th Battalion, 1st Contingent, C.E.F.
RICHARD CURRIE—2nd Artillery Brigade, C.E.F.

Montreal Paper Company.

A. L. BISHOP—2nd Battalion, 1st Contingent, C.E.F. On firing line since February.

Canadian Leather Board Co., Ltd.

JAMES HARTLEY—2nd Contingent.
WILLIAM HALE—2nd Contingent.

Bathurst Lumber Co., Ltd.

ALEC YOUNG—26th Battalion.
RAYMOND LOZIER—55th Battalion.
ALPHONSE ROBICHAUD—55th Battalion.
MAURICE RIX—55th Battalion.
DON. CRAFT—55th Battalion.
J. L. DOUCETT—55th Battalion.
JAMES COLLINS—55th Battalion.
ANGUS BUCKLEY—55th Battalion.

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JOSEPH COOPER—44th Regiment.

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H. C. DUNNING, 6th Field Company, Canadian Engineering Corps.
COL.-SGT. HAROLD DUNN, 20th Battalion.

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British.

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GEORGE WASHINGTON.
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A. F. McBRYER.
ROD McAULAY.
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W. D. DOYLE.
J. FALCONER.
J. COLE.
G. E. COLE.
T. ALLSWORTH.
JAMES CLAPP.
H. A. CARTER.
WM. STANLEY.
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DAVE WILSHIRE.
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AUGUST SLOSSA.
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MIKE ZUKOFF.
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R. ZOKOFF.
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A. VANOFF.
TOM VADIFF.
B. VADIFF.
M. VADIFF.
BORIS URTAEFF.
M. TORCHING.
M. TARIEF.
S. TAGOFF.
M. TAGOFF.
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M. GODIFF.
MIKE FRAY.
ALI ELLOFF.
S. DOEFF.
J. COROFF.
J. CAROFF.

Belgians.

O. PERSON.

Italians.

B. SANTO.
L. BAZZANI.
F. PARON.
A. PARON.

An earlier group of the Campbells, Weymouth, N.S.
Albert M. Campbell. Lieut. K. A. Campbell.
Thos. B. R. Campbell. Colin G. P. Campbell.

(On right), Colin Campbell, Weymouth, N.S., wounded in neck by shrapnel at La Bassee, June 15th.

THE MANUFACTURE OF HIGH GRADE SULPHITE PULP

By L. WIMMER, Appleton, Wis.

(Written Specially for Pulp and Paper Magazine.)

I shall not endeavor to go into the theoretical end of making high grade sulphite pulp, as there have already been many articles written on that subject. I am writing down practical experience which I have gathered in different mills, mostly large and up-to-date ones, using upright digesters, and the ordinary direct system for cooking.

Preparation of Wood.—The woodroom is often the most neglected end of a sulphite or groundwood mill. Needless to say, if a manufacturer wants to make a clean sheet of paper, he must have a clean sheet of pulp, and in order to make a clean sheet of pulp, especially sulphite, the wood must be cleaned before it is cooked. In the cooking of sulphite, if a piece of bark, rotten knot, or any foul wood gets into the digester, it is cooked into a million small particles, which never can be altogether screened or bleached out.

The process of cleaning and preparing the wood for the sulphite process, which I have used myself, and would recommend not only for the cleaning part, but also the economical end, is as follows—

First, the wood must be barked clean. At the other end of the barkers, there should be a man doing nothing else but inspecting the wood, and any blocks with the least trace of bark, rotten knot, or foul heart, should be thrown aside to be either cleaned with a hatchet, hand barker, or small splitter, etc., or piled up separately to be used by itself when enough of this cull wood is on hand to make two or three cooks of inferior grade.

Before the wood enters the chipper, it should be washed, either by automatically dumping it into a vat filled with water (fresh in the summer, or a little warm in the winter time), or by running the wood through a water shower to wash off any loose bark or dirt that might stick to the blocks. The conveyors should be so arranged that the wood that was thrown aside to be cleaned over should again pass the wood inspector after it is cleaned, so there can be no chance of any unclean wood passing by him.

From an economical standpoint, I have found the best way to separate and clean wood is to do very little only on sound blocks with a little bark on, and on larger blocks, with a black heart, that have to be split anyhow. All other cull wood is to be piled up separately, as before mentioned. Of course, before and after cooking cull wood, arrangements must be made to have the chip bin clean, so that none of the chips are left in the bin to get mixed with the good wood. If carefully attended to, that can be very easily done by knowing the contents of the digester in solid cords of wood. A

little less should be chippe dthan the digester capacity, and if running short of cull chips when filling, a little more can easily be chipped, or the digester furnished with good chips if necessary. It is surprising to note after this cull wood is piled up about a week, and given time to dry out, how much good pulp can be made out of it.

After running this pulp over the machines, a general wash-up in rifflers, screens, vats, etc., is necessary to get all the dirt cleaned away before running good pulp again.

The chips should be as even as possible, without slivers or shives. In order to make even chips, it is necessary to keep chipper and bed knives set even and in good condition. The chipper should be fed steadily If there is not sufficient wood to do so, hold wood back and wait till there is enough to feed fast again for a time, and so on. The chipper should be run at as slow a speed as possible. This will not only save power, but will prevent the wood from chumping between the cuts. The slower the chipper runs, the cleaner the cut, thus making little sawdust and more even chips. Most chipper manufacturers can tell the speed their make of chipper should run, to get the best results.

After leaving the chipper, the chips should be run through the crusher. That will thoroughly separate the chips from sawdust and knots. From the crusher the chips should be run through the screen, either revolving or shaking. The opening in screens for sawdust should not be less than 3-16 in. and not more than $^1/_4$ in. Many mills are running with $^1/_8$ in. opening, thinking they save wood, while in fact they only save dirt and sawdust. Any wood smaller than $^1/_4$ in. will produce no fibre, and only takes the room of good wood in the digester, thus decreasing the capacity per digester, and increasing the amount of sulphur used per ton of pulp.

The openings in screens for chips should not be larger than 1 in. to $1^1/_4$ in. Hemlock chips ready for cooking should be from $^1/_2$ in. to $^3/_4$ in. Spruce chips from $^3/_4$ in. to 1 in. on dry wood. When wet and green wood is being used, they may be cut a little shorter.

Any sticks or knots leaving the screen should be run into a vat filled with water which causes heavy articles, such as knots, etc., to sink to the bottom. The good wood which floats at the top can be rechipped, screened, and used over again. One eastern mill, which has the reputation of making clean sulphite, floats all chips. The vat must be cleaned from time to time, removing the knots.

In Germany, it is customary to run the chips over a series of wide canvas belts, with girls picking out all large sticks and knots. The advantages resulting from even chips, are: Large production per digester with less consumption of sulphur and lime per ton; no slivers in finished product; reduced waste in screen room, as large chips and knots are only affected on the outside in cooking, leaving the inside uncooked. The chemical reaction in cooking even chips is more perfect at the end of the cooking than it is in cooking with uneven chips. The pulp screens and bleaches better, and it is more satisfactory all round.

The best wood to use is that which has been seasoned for one year, and piled so that the air circulates through the stacks, thus not only drying the top of the stack, but also the centre and bottom. Young hemlock or spruce produces a better fibre and yield per cord than old and large trees. Wood piled for a year also produces a better yield per cord, a better grade of pulp with less consumption of sulphur and bleach powder per ton, with increased production of the mill, and less percentage of screenings. The saving made by using seasoned wood as above mentioned will pay many times for the labor of piling same up.

ACID.

In making acid with a tower system, the most important point is to get the right kind of limestone. A stone of high percentage of magnesium, and low percentage of calcium oxide is preferable, especially in the summer time. Dolomite is used to a great extent, especially in hot weather. High magnesia has many advantages over high calcium lime. The acid made by the former absorbs the sulphur gas more readily than calcium, and the acid can be brought to a higher percentage of free SO_2. The fibre made with high magnesia acid is more pliable, has a better binding quality also bleaches better, and has a silky appearance. There is seldom any trouble with lime in the digesters, blow-pit bottoms, or in the finished product if the acid is kept to a combined SO_2, not over 1.20 per cent, while acid containing high calcium oxide often causes digesters and blow pit bottoms to lime up, also sometimes causes lime in the finished product. The pulp made with such acid is harsh, the fibre is more stiff, and bleaches less readily.

The towers should be filled with stones at least once a week, and after filling the entire tower should be thoroughly washed out with fresh water. The grates also must be kept clean, not only in front but also at the back. In a certain tower system constructed by a well-known engineer, I was compelled to cut an extra door at the back side to clean the grates thoroughly to get the tower in proper working order.

The height of a tower should be determined by the strength of acid made. For instance, on a tower making an acid of 3.40 per cent total SO_2, 2.10 per cent free SO_2 and 1.40 per cent combined SO_2, 130 feet should be high enough, and if the gases are right, the water, coal, and the towers in good condition, there is no waste of gas at the top. When making acid stronger a higher tower should be used, or the acid pumped back through a series of towers. One tower 150 feet high, two towers 75 feet high or three towers 50 feet high are high enough to make any kind of acid. It is much better to use one high tower than two or three short ones, as there is always some waste in pumping the acid back, etc.

The water used should be clear and cool. In the winter when the water is cold it is advisable to use a little steam to take the chill off if the lime is not high enough in the acid. A variation in the temperature of water means a variation in the acid, so the acid maker must watch his water to get even acid.

The most popular device for drawing the gas through the towers is a steam jet at the top of the tower. A fan pump is also used to some extent. Although steam draught works perfectly, it is not always the best; if there is a leak in cooler or any other part between the sulphur burner and the top of the tower it cannot be noticed, unless the acid maker used a candle or something of this sort and examined every joint.

By using a blower next to the burners and blowing the gas through the cooler and tower, the cooler and tower are under a pressure, and every joint must be tight else gas escapes, which can be readily seen, but there is never any chance of air getting into the gas.

The best system the writer found is using a blower next to the burners, and a steam draught at the end of the towers. There should be a speed regulator connected with the blower drive, so that the suction for the burners can be regulated by the speed of the fan. By using a certain amount of steam at the top of the towers, and doing the regulating by speed of the fan or blower, perfect results are obtained for the reason that the fire in the sulphur burners can be kept absolutely regular. By using steam only sometimes, there is more or less condensation in the steam before it reaches the top of the tower, and a variation of draught is the result which always affects the gases.

In making acid in a so-called "milk of lime" system, the lime should also be of high percentage of magnesia, well burned, free from impurities, and should be as fresh as possible, not air slaked. Steam should never be used in slaking this lime.

The writer has found that the best way to slake lime is as follows:—Fill your slaking tank with water about one inch over the perforated plate, dump in whatever lime is used in one dump, sprinkle the lime with water on top, and let stand until it commences to steam freely, then cover quickly with water. Care must be taken not to let the lime steam too long. By using this method the lime water will always be cool.

After the lime has been removed from cars, it should be stored in an absolutely dry place. As little as possible should be kept on hand, and the oldest lime always used first to prevent the stock from getting air slaked.

The gases before entering the absorption tanks or towers must be well cooled, free from sublimed sulphur, sulphur trioxide, and must contain at least 16 per cent to 18 per cent SO_2. Sublimed sulphur generally appears when the burners are not heated enough to burn the sulphur thoroughly, and also when not enough air is used in burning same. Sublimation can be easily detected by drilling a small hole in the cast iron pipes before the gas enters the cooler and from time to time, sticking a glass rod inside for a second; if there is sublimation in the gases it will show yellow on the glass. The addition of air, generally in the combustion chamber, can be easily stopped. Sulphur trioxide is much harder to detect than sublimed sulphur. It generally appears in hot weather, caused by an over-heating and overcrowding of the sulphur burners, and also by getting too much air in the burners. The best temperature to burn sulphur is between 600 deg. C. to 700 deg. C. An experienced acid maker, with the assistance of a good chemist or superintendent, can by practice quickly arrive at the right gases. Acid containing sulphur trioxide affects the fibre. It always shows in the finished product. Paper made of pulp cooked with acid containing sulphur trioxide gets brittle in a short time. Many mills in Europe are washing the gas by drawing same through water to get rid of any sulphur trioxide (SO_3) or sublimation. From this wash water, if any SO_3 is in the gas, they obtain a poor grade of sulphuric acid according to the following reaction $H_2O + SO_3 = H_2SO_4$.

No doubt the best way is to carefully watch the sulphur burners, and there will be no trouble with the sulphur trioxide.

Sulphur Burners.—There are a number of sulphur burners in use, but no doubt the best burner is a good rotary with a large combustion chamber at the back end, and a self feeding device at the front end. The gases can be made stronger and more even, air can be regulated better, and in case of a shut down the fire stopped and started quicker, the ashes can be burned out, so there is absolutely no waste when cleaning out.

In one large mill, every time the acid plant was shut down and the absorbing tanks cleaned out, the first three or four cooks made with new acid bleached hard, the writer simply, after a regular clean up in the acid plant, only used rotary burners, got the fires heated faster, and made the first acid stronger, and the trouble stopped.

Every chemist knows that when gas enters the towers or lime water, the first stage in the combination is monosulphite. When weak and poor gas is used the reaction is not complete, and the acid contains monosulphite. Pulp cooked with such acid is generally of poor quality and bleaches hard. By starting the fires faster, the heat of the burners is brought up to the required degree in a short time, and the gas up to strength, and by making the first acid stronger the reaction is complete, thus eliminating monosulphite in the acid. The sulphur used should be of the best quality and absolutely dry and free from impurities.

Rules for the Operation of an Acid Plant to Get the Best Results.

The gas should be tested at least once every hour.

Temperature of water should be taken every hour.

The acid should be tested separately from tower once an hour.

A record should be kept of different kinds of lime or limestone used and results obtained.

The temperature of sulphur burner should be kept even.

Cooler and cast iron pipes must be kept clean; and better than all,—**the acid makers should work together and not against each other.**

(To be Continued.)

PULPWOOD RATES INCREASED.

The complaint of Messrs. Auger and Son, of Quebec, and the D'Auteuil Lumber Company against the proposal of the Canadian Pacific Railway to increase in the freight rates on pulpwood from a number of points on the C.P.R., to Mechanicsville, N.Y., via the Boston and Maine Railroad, has been refused by the Dominion Railway Commission in a judgment just issued by Commissioner McLean and endorsed by his colleagues on the board.

The increases proposed were from 10½ cents to 13 1-5 cents via Sherbrooke or Lennoxville and from 9½ cents to 11 4-5 cents via Newport. Commissioner McLean states that in his opinion the proposed rates are reasonable, and should be allowed. They will become effective on November 1st of this year.

Many friends in the trade learned yast week with regret of the death of David E. Jones who passed away suddenly at Donald, Ont., from blood poinsoning. He was lately superintendent of the Wood Products Co. of Canada, limited, an dthe Standard Chemical, Iron and Lumber Co., Limited. Mr. Jones was fifty-seven years of age and widely and favorably known.

THE MANUFACTURE OF YARNS AND TEXTILES FROM PAPER PULP

The use of textiles of various kinds, cordage, string, etc., manufactured from paper, is on the increase, and the methods by which these goods are produced are of considerable interest. There are certain features common to the paper making and the textile industries, so that a web of paper and a textile yarn may be made from the same raw material, and, further, have the common characteristics of an agglomerate of discontinuous fibrous elements produced in continuous lengths. The strength, or cohesion, of the two fabrics depends, in the first place, upon the surface adhesion of the fibrous units but in the case of the textile yarn this is a much less important factor than the twist communicated by the spinning process. On the other hand the paper wet through, devoid of twist, shows certain characteristics in the opposition and adhesion of its structural units which makes it a more coherent agglomerate than the yarn. As a rule this bears reference to the wet processes of the paper maker which brings the colloidal fibre substance into a condition of gelatinization in which a more intimate adhesive contact of the fibre surfaces is determined. The cohesion is increased by the pressure to which the web is subjected while still in the wet state, and the union of the fibre surfaces is at last cemented by the drying of the web. Conversely, when rewetted a paper is brought back into approximately the condition of the web as first put together, and its cohesion in this state or wet strength is only a fraction of that of the paper. On the other side, the cohesion of a textile yarn is only slightly affected by wetting and the effect is not of necessity in the direction of lessening tensile strength. The limit of economic handling in the textile industry is reached with a length of fibre of 3—5 mm. This inferior limit expresses, on the other hand, the outside limit imposed upon the paper maker for the satisfactory working of his wet web upon the wire cloth of the machine or hand mould, and for the majority of papers a length of 1—2 mm. is a working optimum. This agrees with a clear complementary relationship of the two industries, and the paper maker up to fifty years ago was restricted as to raw material and to wastes of the textile trades. The problem of converting the continuous length of paper into a textile yarn may now be under consideration. The points in the problem may be said to be:

(1). The subdivision of the web of paper into strips of suitable dimensions.

(2). The rolling of these strips continuously into the cylindrical form.

(3). Subjecting the cylindrical length of paper "felt" to a twisting operation so as to increase its tensile strength to a maximum.

Having by these processes appreciated to a maximum the tensile qualities of the fibrous agglomerate, there is still to be considered the intrinsic limitations of quality due to shortness of fibre, on the one side, and the fact that when wetted the product loses its cohesion. Ever since 1891 a movement has been on foot to introduce textiles manufactured from paper, and, although this has been quite novel in Europe, the Japanese have, for centuries, employed paper as a basis of string or twine, twisting paper strips of convenient width into the cylindrical form, and also piecing successive lengths to obtain a continuous fabric. This, however, was simply a piece of manual work performed upon the finished paper.

The industry has had its origin in Germany. Quite a number of German inventors have studied the subject, but some few years ago it began to engage the attention of English experts with the result that there is now notably made in England by the Textilite Engineering Company, Ltd., of Southwark Street, London, S.E., a complete plant for the carrying on of all branches of the industry which is superior to any of the German systems in economy and excellence of production, and one now daily comes across those peculiar textile commodities which may be successfully manufactured from paper pulp, and which have been manufactured in Great Britain. Inventors have tried to overcome the unfitness of paper, as such, for textiles or weaving purposes by changing the form and usual dimensions of the web of paper. The stages in the production of a cylindrical product, or yarn, are: (1) cutting, (2) rolling, and (3) subjecting the cylindrical rolled strips to a twisting process while in a moist condition, and these treatments increase the solidity, and resistance of the agglomerate.

From numerous tests which he has made of paper pulp textiles, Professor Pfuhl concludes that these yarns made from pure wood cellulose have a mean breaking length of 5 to 7 km., with an extensibility of 6 to 7 per cent., and these constants define a textile quality sufficiently high for their utilization under the ordinary conditions of weaving both as warp and weft. The warps of wood-pulp yarns need no previous dressing, or sizing. The finished fabrics have about one half the strength of jute fabrics of the same make and weight. When wetted, however, they lose their tensile quality, and although they regain their strength in drying, this fault is a serious one. Nevertheless efforts are being made to surmount it.

With respect to the cost of producing paper pulp yarns Professor Pfuhl has made estimates based upon a daily output of 6,000 kg., or 1,800 tons per annum, involving 2,160 spindles running eleven hours, the corresponding production of sliver strips running continuously, i.e., twenty to twenty-four hours per day. In the estimates the production of a No. 3 (metrical) yarn is considered. The capital outlay is summarized as follows: Site and land, 15,00 kr., 15,300 marks; buildings, 71,400 marks; machinery and plant, 309,500 marks; business capital, 126,800 marks; total, 523,000 marks. These represent an annual charge of about 36,000 marks, and adding salaries the establishment represents a charge of 56,807 marks per annum. Wages are estimated at 60,320 marks, and coal (at 20 M.) 43,160 marks, adding for lighting, packing, etc., 41,000 marks. The total annual charge is 201,287 marks. On the basis above set forth this gives a cost of production per ton of 111.83 marks.

Comparing these costs with those of spinning jute to yarn of the same count, which has been estimated at 100 to 120 marks under the same conditions, it is seen that they are some 10 to 20 per cent. higher. The respective raw materials have now to be considered, namely, sulphite cellulose at 15 to 18 marks per 100

Reproduced with a few minor changes from "The Textile American".

kg., and jute at 10 to 14 pounds per ton. The final comparison is made in the following terms:

	Marks for 100 Kilos.	
Total cost of production.		
Jute Warp Yarn No. 6	34	43
Jute Weft Yarn No. 5 and 4	31	39
Paper Pulp Yarn	28	32

It has been said that the effects of the treatments in making paper pulp yarns increases the solidity and resistance of the agglomerates. This is shown by the following table:

	Breaking Length. km.	Elongation per cent.
Plane strips dried	4.17	2.84
Rolled into cylindrical form	5.18	2.71
Rolled and twisted	6.41	3.06

The following numbers refer to wood pulp yarns as industrially prepared at the present time:

Mean of 240 tests	5.498	6.8
Maximum observed	8.314	10.5
Minimum observed	4.10	2.9

by one process. By another:

Mean of 90 tests	6.159	7.71
Maximum observed	7.695	11.16
Minimum observed	3.619	4.38

The shorter units common to papers yield a texture aproximating in mechanical properties to the lower grades of spun yarn.

The following is one system by which paper yarn is produced, a finished but unsized paper being the raw material. This is cut into fine strips of a few mm.'s width, each strip being separately wound on a bobbin which is then transferred to a spinning, or twisting, frame. In the form of twist it is subject to a rolling process to consolidate the thread, and this treatment is repeated after moistening the thread in a second machine, the speed of which is adjusted to produce a certain drawing effect. The spindle for the spinning, or twisting, of the paper strips is as follows:

The spool, or reel, carrying the paper strip of 2-3 mm. width is carried on a hollow brass axis which is held in position on the spindle by means of springs. The fliers rotate in the same direction in which the paper strip was wound on the spool, and the strip is thus twisted and drawn off through rollers under suitable tension.

There is little doubt but that this industry has been carried on for some years now on the Continent of Europe with fair profit to those engaged in it, and that the use of these textiles is on the increase. The lines of trade for which the yarns are suitable seem to have been located in England, also the establishment of works to make the machinery needed to produce them, which appears to be a sign that the trade is also spreading in Great Britain. When decorated with colors the materials look very pleasing.

There are also two other methods in which the commencing point, that is, the web in the unfinished state, is passed from the press rolls of the paper machine. One is the process of R. Kron, by which the threads known as Silvalin Yarns, are produced. It will be clear from what has been said that wood pulp spinning is a cross adaptation of well known paper making and textile systems to the manufacture of a special kind of material, and brings forcibly into consideration the matter of the cost of manufacture,—in fact the industry depends principally upon the cost of manufacture. In this process the production of the original pulp strips is intensified by using the ordinary Fourdrinier machine at its full width, the web being subdivided into narrow strips by a contrivance for projecting jets of water upon the web at such distances apart that the web is divided into 100-500 strips per meter. The separation of the strips, however, is not thus accomplished, they are wound up on a roll of the full width, and are later separated and detached as discs. Several patents are comprised in the invention, the chief of which is a process for twisting, or spinning, the cellulose (pulp) directly from pulp rolls. Additional patents (a) for winding up the wet web at the breadth of the machine to be afterwards divided in pulp discs of suitable narrow width, (b) improvements in the manufacture of pulp rolls in a moist but coherent condition. Other main patents are for (1) process and apparatus for winding up moist strips of paper pulp, etc., (2) process and apparatus for subdividing a web of pulp (as on the wet end of a paper machine) into strips, (3) apparatus for direct delivery of moist pulp strips (4) spinning machine for preparation of detachable cops.

The course of operations in the Kron system is: (1) The creation of the web on the Fourdrinier wire and its subdivision into strips by the impact of jets of water for the number of strips needed to be formed. (2) The pulp strips are submitted to the action of press rolls for the slow elimination of water and progressive solidification of the fibrous aggregate, and next it is dried by heat on a steam heated cylinder, and then wound up in what is called a magazine roll, which holds a series of discs in close contact. These are detached as needed for the further process of twisting, and are disposed for winding off, in a horizontal, or inclined, position below the spindles. (3) The winding off and twisting necessitates the passage through the machine, which is the subject matter of another patent, from which the strips are delivered continuously to the spindles. These have a speed of from 3,000 to 8,000 revolutions per minute with the sliver running at from 8 to 16 metres per minute according to the size of the yarn, and degree of twist needed.

The other system was patented in 1891, and the patents cover the formation of a pulp sliver by taking moist paper strips as delivered from a cylinder paper machine, and submitting them, while still on the cylinder wire, to a rubbing and rolling treatment by which they are rounded and consolidated. The production of the paper or pulp strips is not patented. This is carried out by the novel construction of the wire cloth of the paper making cylinder which is an alternation of impervious brass strips with the ordinary 60-70 inch mesh wire cloth, the pulp being deposited on the latter.

The salient point in the treatment of the strips is the process of conversion from the flat to the cylindrical form, under which there is an incidental consolidation of the fibrous aggregate. This effect is obtained by passing the strips through a special contrivance, the principle of which springs from an invention by O. Schimmel & Co., Chemnitz. The invention was in its inception applied to the lap of dry carded short fibre as delivered from a textile carding machine. The lap delivered at the full breadth of the card is received

between a pair of rollers that divide it by a peripheral cutting arrangement into narrow strips which pass forward to the rolling apparatus. This is composed of an upper and under endless band of leather in close contact, disposed for motion in the horizontal plane, each round a pair of rollers moving in geared connection. The turning of these rollers carries forward the non-divided strips but an alternating movement in a right angle direction is given to the leather bands by eccentrics. This movement is, in turn, communicated to the strips as they travel forward, under which they are subjected to continuous rubbing, and are rolled into cylindrical form. They are next suitably laid down in receivers to be transferred to the spinning, or twisting frames.

In a modification of this process as applied to the wet pulp strips, a like apparatus and process succeeds the pressing rolls of the paper machine. The endless bands of the rubbing and condensing rollers are in this instance made of India rubber. The third process, which is that of spinning or twisting, is performed on the still moist thread. The same principles and forms of machines as are used in the textile industry for giving a high degree of twist to textile yarns are employed by the paper pulp spinner. The twisting is principally performed on "Ringzwirnmaschinen," or ring spinning machines, frames which have sixty to seventy spindles on the side.

In the production of weft yarns, the delivery of the spun yarn is varied so that it may be wound directly into cops or onto tubes placed over the spindles. R. W. Sindall, says there are two limitations to the efficiency of this method, one is in the method of making the pulp strips on a cylindrical machine. The alternative process, a machine based on the flat running Fourdrinier wire with its much higher productive capacity, is adopted as the basis of a competing system. The second limitation of efficiency, that is in output, and, accordingly, in cheap production, is in the speed of the machine, and process of rounding and consolidating the strips. In actual working, allowance has to be made for breaks and stoppages which cannot be avoided and the output is taken at 30 per cent. less than figures actually arrived at by calculations based on the speed of the machine. A beating engine, Hollander, of 160 to 200 kg. capacity (dry pulp), dealing with four charges in the twenty-four hours, would feed two of these special machines.

One matter which is most essential to success in any system devised for the production of paper pulp yarn is that the sliver machine employed in it shall have a good daily output. This is most important, and careful attention must be given to the question of the subdivision of the web of pulp into small strips if it is to be a cheap one. With respect to the best means for distributing these to the following processes, one patent has been taken out which deals with the rounding of the strips to a sliver by passing them through a funnel, the tube of which is of spiral or other special make. This treatment immediately precedes the operation of spinning, or twisting. Those interested in the industry should note these last remarks carefully.

The following are results of tests made to ascertain the degree of tenacity and elasticity possessed by yarns produced by various systems for the spinning of wood pulp yarn:—

	Metrical count.	Breaking strain in terms of breaking length.	Extensibility per cent.
Silvalin strips (dry)	2.891	2.390	3.06
Silvalin yarn (dry)	2.900	4.810	0.44
Altdanim Turk strips ...	13.153	4.170	2.84
Strips rounded (silver) ..	8.222	5.014	2.24
Strips rounded (silver) .	8.408	5.187	2.71
Finished yarn	12.100	6.413	3.06

Metrical numeration is applied to all wood pulp yarns, the number of meters (unit of length), to the grain (unit of weight), gives the count. The strength or tenacity of yarns is ascertained as a breaking strain, but generally expressed as a breaking length, that is the length of the breaking weight of the yarn itself. This may be compared, forthwith, with the sectional breaking strain generally applied to solid substances. For where L expresses breaking length, S specific gravity, and K breaking strain per 1 mm. of sectional area, $5 \times S = K$, says another authority.

Wood cellulose differs but very little from cotton cellulose.

A prominent firm in London owns a number of patents for machinery for the manufacture of paper yarn and textiles all over the world, and controls the sole right of nearly all successful patents owned by other firms. In addition to these it has different processes by which it is able to soften the yarn, strengthen the same, or waterproof it, but wherever strength is required it is advisable to use kraft paper. It makes a patent paper cutting, or slitting, and rewinding machine which takes a roll of paper 30 in. wide, cuts it into narrow strips ¼ in. to ⅜ in., or wider, and rewinds it again on separate discs up to a diameter of 30 in. The discs which are wound up very hard can easily be handled without fear of breakages, and these large rolls give a long continuous feed on the spinning machine, which is a very important item. On nearly all other machines discs cannot be produced of a larger diameter than 12 in., and then these have to be separated by force, which often causes the discs to collapse.

A patent paper spinning frame which spins from rolls 30 in. or less, in diameter, onto bobbins. A special feature of this machine is the large number of revolutions it makes per minute. With ordinary 16 or 19 pound kraft paper the company has run this machine up to 5,700 revolutions per minute, which will give a production of nearly 26 yards of yarn per minute. This has never been accomplished by any other machines. All other spinning frames do not exceed 3,000 revolutions per minute, which is 13 to 15 yards per minute. The machine is provided with copper damping troughs, brass covered delivery rollers, and a hand stop motion for each spindle to be used for piecing or for doffing. The whole machine is provided with a damp preventing arrangement to be used at night or at a meal hour.

In addition to these two machines, which are the most important, it makes the following:

Standard quick traverse cheese winder. This machine is specially adapted for paper yarn, to make cheeses on paper tubes, with special creel for unwinding paper yarn spinning bobbins from the side. A copping ma-

chine that is particularly suited for paper yarn to make pirns on bare spindles, with special creel for unwinding paper yarn spinning bobbins from the side. A beaming machine for paper yarn. This machine takes in weaver's beams for paper cloth up to 54 in. wide. It is constructed to wind from cheeses or bobbins onto weavers' beams.

In looms the company makes the fastreed and underpick types for weaving paper cloth 54 in. wide, but ordinary jute looms and some cotton looms may be adapted for weaving paper yarn.

A two bowled calendar with patent damping and gas heating arrangement, which is most suitable for paper yarn fabrics, consists of a pair of castiron frames well stayed together, and fitted with top and bottom blocks with hard brace steps, top steel adjusting screws with hand wheels and powerful springs, let off apparatus with brake, and friction catch tackle, two cast-iron bowls each turned and ground to a perfect face. The bowls are geared together by connecting wheels to prevent skidding.

A patent 8 in. x 4 in. driven ring twisting machine for paper twine. This machine with its high speed and regularity of twist is peculiarly suited for the manufacture of paper twine. The principle of the driven ring combines the high production of ring frames with the accuracy of flyer frames, and at the same time simplifies the work to such a degree that the high standard of expert knowledge on the part of the operator required for these old type frames may be safely dispensed with.

Each ring has a hardened steel flange which runs on four hardened steel rollers mounted in a dust proof oil bath, containing sufficient oil to keep a perfect lubrication for about 12 months. The construction is such that no dust or grit can get into the oil, and no oil can be thrown on the work.

The yarn in the process of twisting drives the bobbin and the bobbin is locked on the spindle. The patent elastic drag controlled by screw adjustment is applied to each individual spindle so that a constant scientific drag is maintained, and rough or chipped bobbins have no adverse influence on the drag.

The machines are usually made double sided, but the sides are driven separately so that two different classes of work can be carried on simultaneously. The machine is of exceedingly rigid and heavy design to stand the high speeds which can be obtained with driven rings. All gears are machine cut.

On most paper twines a speed of 2,500 revolutions per minute is a safe working speed for a machine taking bobbins of 8 in. lift x 4 in. diameter.

Each machine is equipped with the following: Right and left yarn guides on rings for twist and weft, 8 change gears per side giving a range of twists from 2 turns per inch to 35 turns per inch—complete set of driving bands, one set of spanners, creel of 4 pegs per spindle, quantity of ring oil sufficient for one gang of rings, and special spindle oil sufficient to start the machine.

A 24 spindle bobbin to bobbin polishing machine for paper twine. This machine is specially designed for paper twine. It takes the twine from the twisting machine bobbins and, after polishing 24 ends simultaneously, rewinds them on similar bobbins, so that no intermediate winding process is necessary, and as both sets of bobbins hold the same amount of yarn there are no knots in the twine and no waste. The twenty-four twines pass through the starch mixture, and travel round the feed cylinders 8 or 10 times, coming in contact each time with the polishing cylinders, so that they arrive at the winding bobbins thoroughly dry and beautifully polished. The action of the motion is entirely automatic. The machine is of rigid construction, the brush cylinder covered alternately with eardwood beater lags of horse hair brushes of first quality is accurately balanced, and runs in self-oiling bearings. The feed cylinders are of seamless brass tube, and a suitable range of change gears is supplied to give feeds suitable for the various thicknesses of twine.

The winding spindles are of a very robust pattern, and are of the self-oiling type. When once oiled they require no further attention for 6 to 12 months. One operator can attend to two machines.

A patent high speed precision cross spooling machine for paper twine. This machine is specially adapted for winding paper twine from twisting or polishing bobbins in such a manner as to form a hard and compact spool on a paper tube without incurring the cost of a flanged bobbin. The machine is rigidly built, and has no parts liable to wear or get out of order. The main bearings are self-aligning, and have a special ring oiling feature which provides thoroughly efficient automatic lubrication for six months after each filling. Each headstock is a separate machine, in itself, provided with its own starting and stopping arrangements, and capable of being run on any thickness of twine independent of all other headstocks on the same machine. The high speed traverse mechanism runs in a dust tight oil cylinder. A differential mechanism automatically secures exact mathematical laying of the twine from start to finish of the spool. Each head will wind single spools up to 6 in. traverse x 6 in. diameter, or two spools simultaneously up to 4 in. traverse x 6 in. diameter.

A patent 8 spindle automatic balling machine for paper twine which has been specially designed for automatically winding polished twine into balls of even size and weight. Soft twine on the original twisting machine bobbins or polished twine on the polishing machine bobbins is placed on the creel and is wound by the machine into balls of prearranged form and weight, without special experience on the part of the operator. An even tension is applied to the yarn throughout the winding by a patent device on the creel. A revolving creel peg prevents wear on the creel bobbins, and a special brake device prevents over running of the creel bobbins, which would lead to a loss of twine and a waste of material. The starting end of the twine is held in such a way that it can easily be found by the user and the ball unwound from the inside without waste. The machine is light running but of rigid design. It is supplied equipped with a full range of change wheels to suit any ball within the limits of the machine. Balls up to 3 in. diameter can be wound. An automatic net changing device is provided for changing from open to close netting during the process of winding the ball. A treadle running the length of the machine enables the operator to stop the machine instantly from any position. An experimental treadle is also provided which enables the operator to control the shape of the ball without a forming can when making new shapes of balls. The eight balls are doffed simultaneously by the movement of a hand lever, when the machine has stopped after completing the winding.

The company have also a waterproofing process which is worthy of attention. It has been able to evolve a process by which the paper is waterproofed

while being spun on the spinning frame. In the same way this can be done in the manufacture of twine either by waterproofing the yarn or waterproofing the twine in the process of twisting. This procedure not only makes the yarn water-resisting but furthermore increases its strength, and gives to the yarn a flexibility or rather elasticity which has never been attained before in paper yarn. Messrs. Clayton, Beadle and Stevens, the well-known analytical and consulting paper chemists of London, have made tests for the company comparing the strength between yarn which was moistened with ordinary water, with the waterproofing material, and the result shows that when this waterproofing solution is applied the wet strength is increased by over 40 per cent, while the dry strength is increased from 35 to 40 per cent.

THE MANUFACTURE AND TECHNICAL EXAMINATION OF COATED PAPERS AND THEIR CONSTITUENTS

The use of coated papers of late years become increasingly large. Both for half-tone and colour printing the employment of "art" papers is very general, while for various branches of decorative printing coated papers are in considerable demand. Fancy cardboard boxes with enamelled surface, either white or coloured, are largely produced to meet the demand for an artistic finish to these articles.

By the term coated or surface paper is understood a product formed by the addition to the surface of an ordinary paper of a mineral enamel, which latter is caused to adhere to the paper by the presence of an admixture of some adhesive. This enamel, which may be white as in an ordinary "art" or "chromo" paper, or coloured by means of pigments, dyestuffs, or lakes, gives a surface perfectly even and smooth, capable of taking a high degree of finish, and well adapted to give exactly the degree of absorbency necessary for printing inks. It thus presents the ideal medium for taking impressions showing the clearness of detail and definition required in process printing. It is to be regretted that coated papers, while so satisfactory from this last point of view, should be so lacking in durability and resistance to wear and tear.

It is not intended here to discuss in any detail the actual manufacturing process of coating paper, but a short sketch of the process is necessary in order to convey a proper impression of the characteristics of the finished article.

The mineral matter having been thoroughly incorporated with the requisite quantities of water and adhesive, together with any colouring material necessary, the resulting mixture of "colour" is fed into a trough attached to the front of a drum machine. In the trough are felt-covered rollers between which the paper runs, and of which the lower dips into the colour and transfers the latter on to the surface of the paper. After leaving the trough, and while still on the drum, the paper is subjected to the action of a number of long brushes fixed transversely across the machine, which thoroughly distribute the enamel on the surface of the paper, making the coating perfectly even. Some of the brushes are fixed, and some called "jiggers" have a regular side-to-side motion. The bristles on the first brush are coarse, while those of the last brush are fine and soft to ensure the absence of brush marks on the finished surface. After leaving the drum, the paper bearing the wet coating is dried by being carried slowly round the drying room on a special carrying contrivance, in a series of festoons which hang down and travel bodily along the room on rails. The temperature of the air in the drying room is maintained at about 100 deg. F., and on completion of its journey the paper, now quite dry, is reeled up. When a double-sided coating is to be given, the reel is returned to the coating machine, and the whole process repeated. Finish is imparted to the surface by supercalendering. Where an extra highly polished surface is required brushing is resorted to. This is effected by an arrangement of cylindrical brushes, usually four, and of which the end members revolve in fixed bearings, while the two middle brushes have a regular side-to-side motion. During the operation of brushing French chalk is distributed over the surface of the paper, the surplus being removed by a fan situated over the machine.

Henry Aldous Bromley in "The Papermaker and British Paper Trade Journal."

The Body Paper.

The question of the suitability of the paper used to carry mineral surfaces for coated papers is one to which often too little attention is paid. When the evanescent nature of the coating is considered it becomes evident that the use of body papers of inferior quality will not tend to improve matters. Freedom from mechanical wood is very necessary and should be insisted on. Further than this, certain other requirements in the manufacture of the body paper have to be fulfilled in order to give good results when the paper is coated. These requirements are:—

(1) Good colour.
(2) Uniformity of substance.
(3) Suitable degree of finish.
(4) Minimum of stretch.
(5) Suitable degree of sizing.
(6) A fair degree of strength and resistance to wear.

Colour.—A good bright shade of colour is most important where a white enamel is to be applied on a thinly coated paper.

Uniformity of substance is essential in order that an absolutely even coating of uniform thickness may be applied. The felted rollers which apply the enamel being in fixed bearings, the feed of colour will vary with irregularities in the thickness of the paper.

Finish.—One of the difficulties in obtaining a perfectly level and even result is due to the colour clinging to loose fibres on the surface of the body paper. Although good finish is necessary, a highly-glazed surface is not required, and indeed for heavy coats a surface very nearly approaching "matt" is advisable.

Stretch.—A body paper which has been run "wet" on the machine, and therefore subjected to considerable contraction, is likely to give much trouble on single-sided coating machines, as the application of the colour expands the paper considerably, and contraction again sets in on drying, the result being that the festoons curl inwards. On the other hand, a paper made from "free" stuff, although much easier to handle on the coating machine, does not, of course, produce so close a sheet, and cannot look so smart after coating. Experienced body-paper makers seek the happy medium between these two extremes. For the very finest chromo papers intended for colour lithography, stretch should be eliminated by rolling in both directions of the sheet. Of course, the question of expense enters largely here.

Sizing.—With a paper too hard sized difficulty will be encountered in getting the enamel to hold on the surface. It is not unusual to find paper so hard that the colour, if a heavy coating, runs down the paper as it is formed into festoons, in drops; and in this case the only remedy is to apply the colour in two thin coats. On the other hand, a paper too soft in sizing allows the moisture to penetrate even before the brushes have had time to smooth the colour, while the liability of the paper itself to break under strain is much increased.

Strength.—The following figures show the breaking strains per square inch of four representative samples of good semi-esparto papers:—

Weight in lb. Double Crown.	Weight of surface to be carried in lbs.	Total Weight.	Breaking strain in lbs.
24	16	40	15
30	18	48	17
36	18	54	19
42	18	60	22

Body papers are required to be flexible and not easily broken on creasing. A furnish of 50 per cent. esparto and 50 per cent. soft chemical wood pulp is found in practice to give excellent results.

The Coating.

The mineral substances in use for forming the enamel in coated papers are:—

(1) China clay (kaolin).
(2) Blanc fixe.
(3) Satin white.

Kaolin, or China clay, is a hydrated silicate of aluminium formed naturally by the weathering of felspar. Its chemical composition is somewhat variable, an average clay containing, however, about 47 per cent. alumina (Al_2O_3) and about 40 per cent. silica (SiO_2), the remaining 13 per cent. being made up of water, small but variable quantities of iron (Fe_2O_3), and traces of other minerals. Mixed with the clay proper is found sand, mica, etc., which are removed to a great extent during manufacture by a process of careful levigation.

China clay for use by the maker of coated papers should be pure white in colour (indicating freedom from iron), of a soft and velvety feel (freedom from grit), should show "fatness," i.e., be capable of giving a stiff paste with water, be regular in size of particles, and as far as possible of uniform composition.

The examination of China clay is conducted as follows:—

Physical Condition.—Gritty particles may be detected by rubbing up a little of the sample with cold water and trying the feel of the resulting cream with the finger. A small quantity mixed with water and allowed to stand in a tall glass jar will detect sand by the latter falling to the bottom long before the finer particles of the clay itself have settled. A microscopic examination of the sample will give an idea of the regularity of the particles and reveal the presence of other earthy matters.

Moisture is determined by igniting a weighed quantity (2 to 3 gms.) in a platinum crucible and noting the loss of weight thereby. Moisture should not exceed 15 per cent.

Iron.—A pronounced yellow shade of colour indicates an abnormal quantity of this mineral; but the natural yellowness may have been disguised by the addition of colouring matters such as ultra-marine or coal-tar dyes. Iron may be estimated as follows: Five grams of the clay are extracted with a little pure hydrochloric acid diluted with water to a definite strength. The mixture is filtered, and the filtrate cooled, and made up to 50 c.c. with distilled water in a "Nessler" glass. A fixed quantity of potassium ferro-cyanide in weak solution is then added. The blue colouration produced is matched by adding the same quantities of ferro-cyanide and hydrochloric acid as previously used to distilled water in another glass, making up to 50 c.c. and running in from a burette a weak standard solution of pure ferric chloride. The quantity of ferric chloride used to produce the same tint of blue is noted, and from the figure obtained the amount of ferric oxide is easily calculated and corresponds, of course, to the amount present in the original extract.

Kaolin is the cheapest surfacing material, and is used mainly in the lower grades of coated papers. The better qualities give a good printing surface, but a poor degree of finish and low colour as compared with blanc fixe and satin white. It possesses, however, the power of absorbing readily the basic coal tar colours without the employment of precipitating agents, and is therefore of easy application in the preparation of surfacing material to be coloured by these substances.

Blanc Fixe, also known as permanent white, pearl white, fast white, etc., is an artificial sulphate of barium produced for coating purposes from "Witherite"—a carbonate of barium of natural occurrence. In the manufacture of Blanc fixe lead-lined tanks are filled with hydrochloric acid of the proper strength and the Witherite suspended in the fluid in cane caskets. In the resulting reaction barium chloride is formed and passes into solution. Sulphuric acid is now added until all the barium has been precipitated as the sulphate. The latter is allowed to settle, and the hydrochloric acid which forms a by-product of the reaction is run off to be used in the production of a further quantity of the sulphate. The Blanc fixe is treated by washing, being finally pumped through a filter press, which compresses it to about 65 per cent. to 70 per cent. solid.

Blanc fixe for coating purposes is required to be quite white in colour, and when tested by mixing a little with glue and spreading out on paper the coating must, when dry, adhere firmly and resist any tendency to crumble when the paper is handled, showing proper washing and consequent freedom from acid residues. When warmed with dilute hydrochloric acid and filtered the filtrate should, on neutralisation with ammonia and addition of ammonium oxalate, give no precipitate (absence of lime salts).

Moisture is estimated in the usual manner.

Acidity is detected by the use of litmus. If present its amount should be estimated by extraction with water and titration of the extract against standard alkali. The presence of any appreciable amount of acidity is a ground for rejection of the sample, since

free acid will frequently ruin the shade of any colouring matters that may be added, and has a destructive effect on the adhesive used.

Blanc fixe as a coating material gives excellent colour, but will take little finish. It is used where a heavy coating of good bright shade and dull finish is required, as in "chromo" papers. Dull finished coated papers are coming more into favour in response to recent agitation on account of the supposed injurious effect on the eyesight of printing on a bright surface. Blanc fixe possesses no affinity for organic colours, but forms an excellent base or vehicle for their precipitation in the form of lakes.

Satin White is produced by the interaction of aluminium sulphate and slaked lime. As marketed it contains besides calcium sulphate, alumina and varying quantities of free lime and is alkaline in reaction. In the course of manufacture quicklime is slaked with water, to a fine powder, care being taken not to produce a watery mass. The slaked lime is placed in heavy cast-iron pans fitted with agitators, and the necessary amount of aluminium sulphate added. The resulting mass becomes very stiff, and considerable power is required to move the agitators, which, however, must be kept going or the finished product is unsatisfactory. The crude satin white is diluted with a considerable quantity of water, passed through a fine sieve to remove grit, etc., and pumped through a filter press. It is usually marketed containing about 65 per cent. moisture. Satin white may be adulterated with China clay, and the amount of matter insoluble in dilute hydrochloric acid should be determined. A good sample should dissolve completely. Samples should not react strongly alkaline as this indicates the presence of considerable excess of lime, showing want of care in the manufacture.

Free lime is estimated by the following indirect method. The fresh sample is dried and finely powdered and 1 gm. weighed out for analysis. This is dissolved in dilute hydrochloric acid, the solution made up to a definite bulk and divided into two equal portions, each containing .5 gm. of solid. One portion is treated for the

Estimation of sulphate, as follows: The solution is heated to boiling and a strong solution of barium chloride added in excess, i.e., until no further precipitate is produced. The mixture is now boiled and filtered, the precipitate being washed until the runnings fail to give any cloudiness with strong sulphuric acid. The precipitate and filter are transferred to a platinum crucible, ignited and weighed. The weight multiplied by .412 gives the amount of sulphate present as SO_4.

The second portion of the original solution is treated for the

Estimation of total calcium, as follows: A strong solution of ammonium chloride is added, and then excess of strong ammonium hydrate. The gelatinous precipitate of alumina is filtered off, after the mixture has been boiled until the ammonia is almost, but not quite, driven off. The filtrate is collected, a drop or two of ammonia added, and finally excess of a solution of ammonium oxalate until no further precipitate is produced. The mixture is heated to boiling point and the precipitate of calcium oxalate washed until the runnings no longer give a precipitate with a solution of calcium chloride, and is then transferred to a platinum crucible, ignited under the blowpipe and weighed as quicklime.

From the amount of total calcium as estimated above, the proportion necessary to combine with the amount of sulphate previously determined can be easily calculated. The balance represents the amount of free lime as CaO in the original sample, and should not be more than 5 per cent. of the weight of the sample.

Satin white gives a good colour and great covering power, and is used where a high finish is required. Specially high finish is obtained by brushing. In the production of lake colours it gives heavier products than clay, but not so heavy as Blanc fixe.

With regard to the proportion in which these mineral ingredients are used in coated papers, where a high finish is not required, as, say, for surface coloured papers and thin arts, about 6 lb. to the ream of 480 sheets double crown is the usual quantity, being increased to 10 lb. when the paper is to be brushed. For dull enamels the dry weight may vary from 10 to 20 lb., some regard being paid, of course, to the suitability of the body paper. For chromos a much heavier surface is necessary, 15 to 30 lb. per ream of double crown being used, the amount depending on the particular purpose for which the paper is required. Extra heavy enamels are applied in two coats.

Adhesives.

The adhesives almost exclusively used for cementing the surfacing material on the body paper are glue and casein. The soluble starch products sold under various trade names are not as a rule very satisfactory in practice, although "Feculose" is said to give good results in combination with satin white. When glue is used the best skin variety is essential for good results. The economy of paying fair prices for one's raw material will show itself here sooner, perhaps, than in any other branch of the manufacture of coated papers. In practice a mixture of one part of glue to three parts of water is employed to make the size, the glue being soaked for twenty-four hours in the water and afterwards heated to 100 deg. F. in a steam-jacketed pan. Of this mixture a quantity is taken on the average equal to about 40 per cent. of the weight of air-dry coating. Casein is used dissolved in a weak alkaline solution, usually of borax, since the latter allows the colours to flow better, and confers antiseptic properties on the mixture. The proportion of casein to air-dry mineral matter is generally about 50 per cent., but heavier amounts of adhesives are required in papers to be used for litho work. A little formaldehyde is generally added to render the size partially insoluble, care being taken to avoid excess, which will stiffen the colour and make an even coating difficult of attainment. To prevent frothing it is found beneficial to add a small quantity—about ½ per cent.—of an emulsion of palm oil. Casein size is always used weaker than glue size, as it makes a considerably stiffer product.

The examination and valuation of these adhesives are fully dealt with in the March number of the "Paper-Maker"—page 407—and their further notice is therefore not required here.

Colours.

In the production of coloured surface papers, both the inorganic pigments and the artificial colouring matters are used, the latter being either simply mixed with the body or precipitated upon it in the form of lakes. Or, again, lakes may be purchased ready prepared for use. The inorganic pigments have the special advantage in most cases of fastness to light, an advantage not possessed in any great degree by the organic col-

ours. On the other hand, these latter are much more brilliant tinctorially, and offer a much larger range of shade.

In the examination of mineral pigments, the chief points to be considered from the point of view of the manufacture of coloured surface papers are:—

(1) The tinctorial power of the sample.
(2) Fineness of grinding and absence of grit, etc.
(3) Absence of mineral adulterants.

Tinctorial power is tested by intimately mixing in a mortar 1 part of the sample with 8 parts of a good white colour such as China clay or Blanc fixe, making into a paste with water, and comparing the intensity of the resulting colour with that of standard mixture containing the same proportion of water and of colour of known quality.

Fineness of grinding, etc., may be estimated by sifting the colour through a sieve of standard mesh until the finer particles have been removed, and estimating by weighing the coarse particles remaining, or as described under China clay by rubbing up with water and noting the feel with the finger.

Mineral adulterants such as **clay, gypsum, etc.,** will show their presence by lowering the tinctorial value of the sample in the test previously described (1). Where colours are capable of decomposition or solution by treatment with acids, etc., such treatment may be employed to reveal the presence of adulterants in the usual manner.

The coal-tar colours are sold either in powder or paste form. As placed on the market they consist almost invariably of a mixture of the dyestuff proper with foreign bodies such as salt, sugar, sodium and magnesium sulphates, dextrine and starch. These substances cannot be regarded entirely in the light of adulterants, since they are added in part in order to dilute the colour, and obviate the inconvenience in working caused by the tinctorially powerful nature of the undiluted dye. Still, one does not wish to pay for, say, starch at the price of colouring matter, and some means of getting an idea of the quantity of inert material present is, therefore, very desirable. One method is to exhaust a very small quantity of the sample by warming with successive quantities of alcohol until no further colour is extracted, and then to dry and weigh the residue. Organic matter present may then be burned off and any mineral matter remaining determined. The tinctorial power of a dyestuff is, of course, of great importance, and should be compared with that of a standard sample by dissolving equal parts of each in water, diluting to a convenient strength and comparing the depths of tint.

Lake Pigments.

This class of colour is of general employment in the manufacture of coloured surface papers. Lake pigments are prepared by precipitating the artificial dyestuffs as insoluble compounds upon a finely-divided substratum, which in the case of coated papers may be either China clay, blanc fixe, or satin white. The precipitating agent varies with the character of the dyestuff, acid dyes being precipitated with barium chloride or soluble lead salts, with which they form insoluble compounds, while for basic dyes tannin is the typical precipitant. The substratum may be ready prepared or may be produced simultaneously along with the lake, as by the interaction of barium chloride and aluminium sulphate. Lakes are also manufactured by the mutual precipitation of basic and acid dyestuffs.

In the precipitation of basic dyes the substratum is made into a paste with water and the requisite quantity of dyestuff, previously dissolved in a little hot water and diluted to a strength of 1 in 30 or 50, added. During the addition of the colour the mixture is kept well stirred. The tannin is now added, together with a small proportion of sodium acetate, which latter neutralises the tannin and assists the separation of the lake. The resulting product is filtered, washed and dried, and is then ready for addition to the surfacing material. The quantities of the ingredients required for lake formation are usually given in full by the colour manufacturers, but it is often found in practice that considerable variation from the published proportions is necessary to get the best results, and the exact quantities must always be a matter for trial. The lakes produced by the use of tannic acid are fairly permanent but dull in shade. To secure a brighter product it is usual to employ a salt of antimony, generally tartar emetic in combination with the tannin. In the presence of sodium acetate, tannin and tartar emetic precipitate the colour as a double antimony and tannin compound, the resulting lake being still more permanent and much brighter in shade.

Another method of precipitating basic dyestuffs is carried out by the use of rosin soap prepared according to one formula by heating 4 parts by weight of powdered rosin with 1 part of calcined soda dissolved in 8 parts of water. In the employment of rosin size complete precipitation only takes place on the further addition of alum or zinc sulphate. The process has the further objection that frothing is apt to be troublesome and the lakes produced, although brilliant, are very fugitive.

In the case of acid dyestuffs an 18 per cent. solution of aluminium sulphate is mixed, while stirring, with the dyestuff dissolved in 25 to 30 times its weight of water, and barium chloride added, or blanc fixe and satin white themselves are first made into a paste with the dye, and the mixture diluted and precipitated with barium chloride. Alumina is very frequently used in combination with the base in lake formation, as its adds fastness by fixing the colour. It is usually prepared in situ by the interaction of aluminium sulphate and calcined soda.

The Eosine dyestuffs require the use of a lead salt for their precipitation as they do not give satisfactory lakes with barium. The lakes produced are very brilliant but fugitive. The precipitation is carried out in a similar manner to that of the base dyes.

The examination of the principal raw materials used in lake formation is carried out as follows:—

Barium Chloride is marketed in the solid state as a white crystalline body prepared by treating Witherite with hydrochloric acid. The crystals should be pure white, quite transparent, and free from iron salts and acidity.

Aluminium Sulphate.—There are several grades of this salt varying considerably in purity. For lake formation a good quality is essential, and a guarantee of content of alumina (Al_2O_3) should always be required. Aluminium sulphate is tested for

Insoluble matter by dissolving 1 to 2 gms. as far as possible in sufficient water, filtering, washing the residue, and igniting in a platinum crucble. The fltrate is made up to a definite volume and examined for

Content of alumina by adding ammonium chloride in considerable excess, and then strong ammonia gradually while stirring, until the liquid smells distinctly of the gas. The mixture is now boiled for several

minutes and rapidly filtered, the precipitate of aluminium hydrate being carefully washed with hot water until the runnings no longer give any precipitate with barium chloride. The precipitate, with its filter paper, is transferred to a platinum crucible, ignited, and weighed. The conetnt of alumina, as thus estimated, should not be less than 15 per cent.

Iron, if present, is estimated by Nesslerising, as described under China clay.

Calcined Soda **(Soda Ash)** is a carbonate of soda varying in amount of carbonate from 60 to 98 per cent. The actual soda (Na_2O) content is determined by titrating a few c.c. of a 10 per cent. solution with normal acid using methyl orange. Each c.c. of acid used represents .031 gms. Na_2O.

Tannic Acid **(Di-gallic Acid).**—The commercial acid is a light brown flocculent powder varying considerably in content of tannin. Only the purest form, which is of a very pale colour, is suitable for lake formation. On incineration tannic acid should leave no appreciable residue.—Henry Aldous Bromley, in "The Paper-Maker and British Paper Trade Journal."

Ottawa Notes

Ottawa, August 24—Before the war started aniline dyes, used in the manufacture of paper, came for the the most part from Germany. No one can be obtained from that country and so paper making plants in Canada, as elsewhere, are being somewhat handicapped for want of good dyes. They are paying at the present more than four times for aniline dyes than they did prior to August, 1914. In order to see if improvements can be made in the logwood dyes, or substitutes made for aniline dyes, chemists at the E. B. Eddy Company's works at Hull, have been making experiments for some time past, but though the results have been encouraging so far they have not yet reached the point that will permit of any definite statement being made to the public, says Mr. George H. Millen, general manager of the company. He says that the company is now paying over $1 per pound for dyes that could be bought before the war for 20 cents per pound, and even at the higher price only a very limited quantity can be obtained.

Mr. Millen says that he estimates the company's business has fallen off from 15 to 20 per cent since the war began and no branch has suffered so much as the paper and pulp end. Owing to the scarcity of water, which prevailed before the heavy rains of the last 10 days, the pulp and paper mills were compelled to close down. While these plants were idle they were thouroughly overhauled and all the necessary repairs were made. They reopened again last Wednesday as the water in the river is at a higher mark just now than it has been at this time of the year for several years past.

Employment agents in the city have been sending men to cut pulpwood in the timber limits owned by firms in the district. A week ago 125 men were sent to limits near St. Jovite for the Riordon Pulp and Paper Company, of Hawkesbury, Ont., and 50 more are to be sent this week. Seventy-five went yesterday into limits owned by James MacLaren and Company, of Buckingham, Que., to cut pulpwood and the E. B. Eddy Co., have sent an advance gang to Lake DuMoine and the Rouge river and more will go forward this week. None of the camps in the limits owned by J. R. Booth have been opened for the season yet, but arrangements are being made for work to start there shortly.

Mr. Charles Proper, of Ottawa, one of the best known millwrights and mechanical engineers to the lumber and paper industries in Canada and the United States died last week in his 79th. year. In his lifetime the late Mr. Proper erected over 50 large lumber and pulp and paper mills in different parts of the Dominion and the United States, among them being the plants of J. R. Booth, Ottawa; James MacLaren Co., Buckingham, and Gilmour and Hughson, Hull. Deceased was a native of Vermont, but had lived in Ottawa for over 50 years.

The prevailing low rates on English gold can be turned to the advantage of Canadian merchants doing business with Old Country houses, so bankers in the Capital point out.

For example a Canadian merchant has an account with a British firm say for £10,000 sterling. The terms are, say, 90 days, with the usual three days' grace. The British firm sends the bill of lading and the invoice to Ottawa, or any other Canadian city. Shortly before the account is due the Canadian merchant goes to his bank and gets a bill of exchange on London. In ordinary times he would have to pay $48,666 for a bill of exchange for £10,000. To-day with the exchange rate down to $4.65, or therabouts, for an English sovereign, he has to pay only $46,516 for the £10,000, thus he makes a profit of $2,150.

Mr. J. R. Booth, the well known lumber and paper manufacturer, has been asked by the city for a piece of land he owns at the end of Elgin street in order to make a needed improvement in the Driveway at that point. It is likely that Mr. Booth will readily grant the request as he has never refused to help the city in any way that is in the public interest.

The total Canadian trade for July reached the $100,000,000 mark according to a statement just issued by Hon. J. D. Reid, Minister of Customs, an increase of $7,000,000 over July, 1914. The feature of the statement is the large increase in the domestic and foreign exports. During July domestic exports reached a total of $45,600,000 and foreign goods exported from Canada amounted to $16,000 compared with $41,000,000 domestic and $8,000,000 foreign for the corresponding month last year. The value of manufactured goods exported last month was $12,500,000 against $5,800,000 in July, 1914. While the exports are booming theer is a decrease in imports. During July $36,000,000 worth of goods were brought into Canada, made up of $20,000,000 dutiable and $16,000,000 free goods. This is a falling off for the corresponding month a year ago, when the imports totalled $42,000,000, made up of $26,000,000 dutiable and $16,000,000 free goods. For the four months of the present fiscal year, ending July 31st, the total Canadian trade was $371,000,000 compared with $306,000,000 for the four months from April 1st, last year.

MacCORMAC.

The Don Valley Paper Co., of Toronto, are installing a complete new filtering system and making other improvements to their plant.

Report of the Forest Products Laboratory, Madison

(Special to Pulp and Paper Magazine.)

Washington, D.C., August 25, 1915.

The report of the Forest Products Laboratory at Madison, Wis., for the year ended June 30, 1915, has just been submitted to the Chief Forester. It tells of the work accomplished during the period. Regarding experiments and investigations in pulp and paper the report says:

"In co-operative work with the Consolidated Water Power and Paper Company, it was established that the character such as strength, feel and texture of newsprint paper can be largely controlled, not only by variations in the grinding of the pulp, but by a subsequent treatment in the refining engines. Other experiments made in co-operation with the Watab Pulp and Paper Company showed that by the elimination of binding of the wood in the grinder pockets it was possible to increase the production of pulp 20 per cent.

"In the usual method of barking wood there is a loss of from 15 to 20 per cent, this material generally being subsequently used for fuel. The recent development of the drum barker has reduced the amount of such material to about 10 per cent. Since, however, this 10 per cent of bark, due to the water used in the operation, is unsuited for fuel its disposal at the mills is a serious problem. Tests conducted at the laboratory showed that it is possible to produce from this bark a pulp suited for the production of a low grade box-board."

The report has the following to say regarding the chemical processes:—

"Distinct progress has been made in determining the effect of fundamental variables in the soda, sulphate and sulphite processes in the production of pulp and paper. In the sulphite process, our investigations have shown the importance of close scientific control of the cooking operation in the production of pulp of the best quality at minimum cost. In the cooking of wood by the soda process the importance of having the chips uniform has been shown and our tests have also indicated a way of elimination the "fuzziness" from soda pulp. Tests with chips soaked in the liquors prior to cooking have indicated the possibility of by this means increasing the yield of both soda and sulphate pulp approximately 5 per cent, together with an improvement of their properties.

"A good grade of kraft paper was made from Longleaf pine stumps from which the turpentine and rosin had previously been extracted. This is the first time that the combination of these two processes has been successful.

"Kraft papers manufactured in Sweden, Canada and the United States were tested and an exact knowledge of the strength properties of the world's supply of kraft paper is now in our possession.

"An instrument to test the tearing strength of paper is being developed in the laboratory. There is at present no instrument for measuring this important property now on the market."

Among some of the investigation relating to pulp and paper now under way at the laboratory are—Comparative pulp making tests on various forest woods; study of the fundamental cooking conditions in the sulphite process; effect of mechanical treatments on the quality of chemical pulps; classification of commercial pulps; studies of wood pulp fibre and paper specialties and others.

Papyrolin or Linen Reinforced Paper

Description of a Process that is Used Successfully in German Paper Mills.

Supplementing an instructive article in a previous number, the "Papierfabrikant" for June 4, 1915, publishes an account of the manufacture of payrolin or linen-reinforced paper by a process which has been used of late with satisfactory results. It is set forth that three kinds of papyrolin are in used, and these are described in detail, as follows:—

No. 1 Papyrolin.

1. Paper consisting of one layer of muslin and one layer of paper . (It is noted that the word muslin is derived from the City of Mosul, on the Tigris, the fabric being also known as nettle cloth; in place of silk it is made in Europe from cotton, with a more or less loose weave.)

No. 2 Papyrolin.

2. Paper consisting of two layers of muslin and one layer of paper between them.

No. 3 Papyrolin.

3. Paper made up of four layers; paper on top, then muslin, paper again and finally muslin.

The processes employed are stated in detail as follows: (1) A roll of muslin of the same width as the paper machine is first wound on a rewinding machine to give it absolutely straight side surfaces. In front of the wire, the roll is placed in a frame with accurate bearings, which are adjustable crosswise and lengthwise to the machine. The muslin sheet then runs in suitable angles over a guiding board and another guide-roller, under the apron on to the wire surface, while the pulp coming from behind the slices spreads over it as a sheet of paper. Two pressing rolls and three flat suctions, couch and felt presses produce a close contact between fabric and paper. The sheet is then carried on to the drying cylinders where a gradual drying with drying felt and weighted rolls complete the process. As a rule only moist finish is used and with a three-roll dry calender.

In making No. 2 paper, the process is the same as in No. 1, only a second web of fabric is carried from immediately behind the slices, from an unrolling attachment. Care must be taken that the apron roll is set exactly parallel with the slices, so that the muslin lies, without creasing, on the paper sheet and is immediately pressed tight by the first press roll.

In making a four-ply product as in No. 3, we have to apply a second layer of pulp to the three-ply web by the Diana process. Although the intermediate layer is usually white, the upper layer of pulp may be dyed or marbled.

In regard to the preparation of the pulp, the upper layer should be ground coarse and short, with sharp knives. The following pulp mixtures proved especially satisfactory for the principal layer.

I.

Bleached linen pulp, first quality	25
Cotton pulp, first quality	25
Bleached poplar cellulose	25
Sulphate pulp, pine wood, bleached	10
Talc	5
Waste, free from muslin, size and color	10

II.

Linen pulp, second quality	10
Cotton pulp, second quality	10
Bleached poplar cellulose	10
Cold bleached fir cellulose	10
Bleached spruce sulphite	10
White paper shavings	10
Bleached straw pulp or esparto	10
Bleached jute pulp	10
Talc	10
Waste, free from muslin, color and size	10

Paper machine papyrolin is recommended because it has the textile fabric more deeply imbedded in the fibre felt than is the case with the pasted kinds. As a consequence, it possesses superior weaving properties and takes ink better, besides being economical as regards labor, sizing material, etc.—"Paper."

Settler's Slash and Forest Loss

Under the above caption the Canadian Forestry Journal for July discusses a most important problem. The writer of the article points out that the burning of slash is one of our annual forest losses and gives as an opinion that particularly in Northern Ontario, Quebec, and British Columbia and to a moderated degree in New Brunswick, the labors of the fire rangers would materially lessen and forest destruction be curtailed, were strict "permit" laws and strict enforcement everywhere in operation.

The testimonies of men in charge of forest protective work refer to settlers' fires in language that does not mince its meaning. Reports reaching the Canadian Forestry Association, the Railway Commission and other public bodies, while gladly admitting the decreasing number of "railway fires," make no such statement of improved conditions among the settlers. So far has the control of settlers' fires fallen behind other concerns of forest protection that the railways are spending considerable sums annually in extinguishing conflagrations unquestionably due to farmers along their routes.

Good Work of Clergy.

What a vicious contribution these clearing fires make to the annual total of destruction may be estimated by some such official figures as the following:—In Manitoba, Saskatchewan and Alberta, outside the forest reserves, 480 fires occurred in 1912 and of this number 108 were due to careless clearing, with 131 due to "unknown causes." In the territory controlled by the St. Maurice Forest Protective Association no less than 80 fires last year were traced positively to settlers—a serious proportion, but at the same time a great improvement on the previous summer when no less than 151 out of 306 fires were of the settlers' doing.

Quebec has undoubtedly made a courageous start in applying the permit system, establishing a closed season during which no fire shall be set unless a permit is issued by an officer of the Forest Protection Branch. The administration of this law has been conscientious and, with wider knowledge of its good objects and an increased staff of officers may introduce the province to an advanced stage of fire immunity. Scores of writs of summons have been served upon guilty farmers and when local magistrates apply statutory penalties with the same thoroughness that characterize the ranger's end of the work, few communities will further resist the Department's orders. The splendid service rendered by the clergy of Quebec to the cause of forest protection doubtless will prove effective in reducing hostility to the permit law.

An Open Confession.

The culpability of the settlers is not a phrase to shield the culpability of others. One discovers references such as the following wherever Canadian forest fires are written of: "We have had several fires, all arising from settlers but all except one extinguished or under control."

And again, in a Watertown, N.Y., interview with a pulp company's president: "There were many forest fires in that section because of the fact that the Canadian farmers attempted to burn out stumps and brush on their clearings and did not give proper attention to the work. At one point the logs were so thick in the river that fire ignited their exposed surfaces and caused such a blaze that a steam fire engine had to be shipped in from a distance of forty miles."

From the settlers' point of view, many excuses are within reach. Rangers in the employ of the St. Maurice Forest Protective Association have been told repeatedly by "homesteaders" located along the line of the Transcontinental below La Tuque that to fulfill their Government obligations they must set out fires no matter what the season may be.

Some of these men have admitted in the presence of inspectors that their lots were taken not for cultivation purposes but solely for the valuable timber thereon. One party frankly informed an inspector that with the assistance of a small boy and horse he had cleared over $1,100 during the winter of 1913-14 and over $500 during the following winter. When asked what his intentions were, once the timber was cleared from the land, he confessed that he would move on to better "pastures" as the soil of the lot was of little use for anything but wood crops.

British Columbia's Example.

It is stated of the British Columbia regulations which compel all settlers to observe a close season for slash burning or to take out a permit, that the farmers are giving the Act willing co-operation. In 1914, out of 11,523 permits issued, only 128 permit fires escaped beyond control, forming 7 per cent of the 1,832 forest fires. Of the 128 fires causing trouble and some loss, even under the permit system, it is instructive to note that many escape control because of sudden high winds which in at least once lifted body of the fire 300 feet into the adjoining woods. The permit system does not pretend to obviate all fires, but who will doubt that it offers the most sensible and economical solution to the problem of settlers' slash?

A charter has been granted to J. R. Eaton and Sons, Limited, of Orillia, Ont., with a share capital of $200,000 to take over and acquire the business of J. R. Eaton and Sons, of that town and to buy, sell and deal in timber lands, and limits, to carry on a timber, log and pulp wood business, and to manufacture and deal in lumber, wood, etc. Among the incorporators of the company, James R. Eaton, Edwin R. Eaton and James H. Eaton, all of Orillia.

UNITED STATES NOTES

The paper makers' strike at the mills in Northern New York has been ended. Twelve hundred men were involved in this strike which lasted for fourteen weeks. The strikers by a large majority authorized their officials to accept the terms of agreement proposed by Louis Wiard and William C. Rogers, of the State Industrial Commission. It took five days of conferences between union officials and owners to reach the agreement.

* * *

The plant of the Unity Paper Mill, Inc., formerly the Potsdam Paper Mills, in Potsdam, N.Y., which has been undergoing alterations and repairs during the past few months, is nearing completion and will soon be in operation. The company has spent about $40,000 in repairs and new machinery, and when the plant starts it will be one of the best in this part of the State. Present plans call for the employment of about seventy-five men, but it is likely that in a year or so the company will install another paper machine, and double the pay roll.

* * *

Workmen are at present putting up the walls for a big addition to the Riverview Coated Paper Company's mill at Kalamazoo, Mich. One buildig is 300 x 500 feet, and the other is 55 x 100 and both will be completed about the first of October. The larger building will be used as a stock room and the smaller one as a machine shop.

* * *

The Mount Holly Paper Mills has been incorporated under the laws of the State of Massachusetts with main offices in Boston. The corporation also has headquarters at Mount Holly Springs, Pa., where its plant is located. The incorporators are Frank Locke, Newton, Mass., Herbert A. G. Locke, Brookline, Mass; Henry T. Maynard, Russel, Mass.; Samuel D. Elmore, Waban, Mass.; and Mildred E. Grover, Everett.

* * *

Benjamin Mintz, general manager of the Niagara Bag & Paper Company's plant at North Tonawanda, N.Y., will go to New York, on September 1 and become general manager of the four bag and paper plants owned by I. Gilman Co., of New York. Charles Gilman, son of I. Gilman of New York, arrived in North Tonawanda recently. He will take over the management of the local plant at the end of the current month.

* * *

The advance Paper Bag Company at Middletown, Ohio, has opened a Boston Office at 201 Devonshire Street. Frank W. Peterson, formerly with the Union Bag & Paper Company New York City, is resident manager. The company will continue to supply the needs of the jobbing trade and will carry stock hereafter in Boston for immediate delivery and rush orders

* * *

The Harmon Machine Company at Watertown, N.Y., manufacturers of pulp machinery and paper screens, is liable to transform a portion of its plant, into a shell making institution, according to latest reports. It is understood that Manager George W. Tripp made a trip to New York recently in connection with an effort to secure a contract with the Russian government. This plant is already equipped to make heavy castings of iron, steel or brass, as well as to do general machine work. With little difficulty it could be fitted up with machinery to make the steel projectiles at the rate of several hundred a day. It is also said that the Bagley & Sewall Co., has equipped its plant to handle a large war order.

* * *

According to the reports a new paper pulp mill is to locate in Hoquiam, Wash. It will represent a $150,000 investment and will manufacture all kinds of paper, including newsprint. It is understood that the mill is not a new one, but is an industry which has been located in the East for many years, and is merely moving to Hoquiam because of the availability of ingredients entering into the composition of paper.

* * *

The Schmidt & Ault Paper Company, of York, Pa., announce that they are manufacturing a complete line of dry and water finish wrapping papers and that they are exporting a large tonnage. The Schmidt & Ault concern is in a good position to look out for foreign needs and invite inquiry for export.

* * *

It was reported at Pittsfield, Mass., last week that in addition to the grand prize received for products of the Eaton, Crane & Pike Co., of Pittsfield, Crane & Co., and Z. & W. M. Crane of Dalton, and Crane Brothers of Westfield, the Panama Exposition of San Francisco at San Francisco has awarded medals of honor for Crane's Linen Lawn Paper and a gold medal for Highland Linen.

* * *

J. W. Deffenbaugh, receiver of the Lancaster Paper Mill, Lancaster, Ohio, last week for the fourth time, offered the mill property, including over six acres of land, for sale. The property had been appraised at $44,919 and the court ordered that it might be sold for not less than $15,000. There was but one bid, that of H. B. Peters, of the Fairfield National Bank, of $15,000, and the property was knocked down to him.

* * *

Col. W. P. Herring, one of the most prominent figures in papermaking circles in Eastern United States died in Watertown, N. Y., on August 16th, at the age of seventy years. His funeral on the second day following was attended by numbers of pulp and paper manufacturers. Col. Herring made provision in his will for the establishment of Herring College, for which provision had been made with the State Legislature.

* * *

The Tompkins process for making pulp by the quick cook method has been declared invalid for anticipation by Judge Ray of the U. S. District Court at Albany. The suits instituted against numerous pulp companies will therefore probably fall through.

PULP AND PAPER NEWS

The International Joint Waterways Commission will hold a series of meetings this month to determine the levels of the Lake of the Woods and its tributary streams. This is a matter of great interest to pulp, paper and power companies, particularly to the Minnesota and Ontario Power Co. at International Falls and Fort Frances. Vast quantities of timber and logs are brought down the streams to mills in those waters.

A charter has been granted to J. Frank Osborne, Limited, Toronto, with a share capital of $40,000 to carry on the business of printers, publishers, wholesale and retail stationers, and to take over the business now conducted by J. Frankland Osborne, 14 Duncan street, Toronto.

Donald M. Henderson, stationer of College street, Toronto, who was a native of Thurso, Scotland, died on August 21 in his forty-eighth year. He had not been well for some weeks but the end came totally unexpected. Mr. Henderson enjoyed the respect of a wide circle of friends.

V. E. Ashdown, wholesale and retail wall paper importer and dealer, Yonge street, Toronto, was drowned on August 16 at Keswick, Lake Simcoe. He was forty-nine years of age and leaves a widow, three daughters and three sons, one of whom is with the Second Canadian Contingent. His body was discovered floating near the Belle Ewart Company ice plant. Financial troubles and the fact that Mr. Ashdown was refused enlistment on account of his age, when he applied, are believed to be responsible for his act. His clothing was found carefully packed in one corner of the boat which drifted ashore.

A federal charter has been granted to the Peninsular Pulp and Paper Co., Limited, with a share capital of $200,000 and headquarters in Thorold, Ont. The company have taken over from Isaac Traub of Niagara Falls, N. Y., the plant and property owned by him and formerly owned and operated by the Inland Pulp and Paper Co., Limited, at Thorold. The new company are empowered to build and operate pulp, paper and lumber mills, the incorporators being Josephine L. Eshelman, Rose K. Shafer, George A. Cleghorn, Edwin R. Larter and William E. Shafer, of Niagara Falls, N.Y.

John Martin of the John Martin Paper Co., Winnipeg and Calgary, who is actively interested in the work of forming a Wholesale Paper Dealers Association has lately received many more evidences of encouragements in shape and will shortly announce details of the work.

It is hoped to receive the support of the Government in order to revive the flax industry in Western Ontario where there are about fifteen idle mills. These are for the most part equipped to handle fibre flax for the production of spinning fibre of the second grade, superior to the average Russian fibre. Options have been taken on several of these properties with a view to operating them next year. It is expected that the forthcoming visit of J. S. Cory, manager of the Barbour flax spinning interests of New England, will put the touchstone of realty to the anticipated boom in Ontario flax, as since the war broke out, the shortage of flax fibre for thread and cloth has caused a boost in prices almost double.

For some time rumors have been prevalent that the Ontario Paper Co., Limited of Thorold, Ont., would increase the size of their buildings and install another machine. Warren Curtis Jr., manager of the company, states that nothing has as yet been decided upon in the way of addition to the plant.

New Brunswick has had a very prosperous year in the amount of lumber cut off Crown lands in the province. The cut, on which stumpage was paid this year ending August 1, was 285,000,000 superficial feet, which is upwards of five per cent more than in 1914 when the quantities cut on Crown lands amounted to about 270,000,000 superficial feet.

Bush fires appear to be constantly out in British Columbia and recently they were raging from Alert Bay to the international boundary line, a distance of 250 miles. The war, it is said, has diminished the fire fighting force and reduced the supply of volunteers available. At latest reports, all fires have been brought under control.

The cost of many lines of paper has not only advanced since the outbreak of the war, particularly in colored stock, but several type companies have sent out notices that, owing to the high figure for all raw materials, they have been obliged to withdraw all quotations.

A leading paper dealer, who returned recently from Espanola, reports that the Spanish River Pulp and Paper Co. are keeping the place right up to the mark in the matter of constant improvements to the workmen's houses which are all nicely painted and with well kept lawn and trees, they present a neat appearance. There is an excellent water and fire protection system and the town is a model one in every respect. The paper and pulp mills of the company are running to full capacity and everybody is busy. Good progress is also being made on the model town, which the Abitibi Power and Paper Co. is developing at Iroquois Falls, Ont. where a hundred and tyenty-five cottages are being erected. There is a good waterworks system at hand and each dwelling is provided with bath room, electric light, etc. The new paper mill of the company is now turning out 120 tons of news print daily and the fourth machine will commence operations about the middle of this month when the capacity will be gradually increased to about 225 tons per day or perhaps more. A visit was lately paid to the plant by Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines for Ontario, who was delighted with what he saw and at the evidences of activity on all sides. Hon. Mr. Ferguson is endeavoring to induce settlers to take up land in the clay belt of Ontario and cultivate it on an extensive scale, clear the property of pulp wood and generally carve out a home for themselves in that fertile region.

The Markets

CANADIAN MARKETS

The demand for news print from abroad keeps up and some mills are receiving inquiries from France, Greece and other countries which they are unable to fill owing to having all the export business that they can attend and supply the domestic demand as well. Prices keep up and the new plant of the Abitibi Power and Paper Co. at Iroquois Falls is now running three machines with an output daily of 120 tons and, in three weeks time it is expected that the fourth machine, which is the largest one, will be in operation when production will be gradually increased to the full capacity of the mill. It is announced that practically all the output is being exported and that no difficulty has been experienced in marketing the news print.

Publishers generally are getting it on all sides these days, for not only do they have to pay firm prices for news print but a number of type houses have, owing to the increased cost of raw materials withdrawn all quotations, while there is likely to be a dearth of colored printing inks due to the shortage of dyes and colors on account of being shut off from Germany. What few are arriving from abroad have gone up from fifty per cent to several hundred per cent in cost, and the time is said to be rapidly approaching when colored printing inks may be obtainable at any figure. This is the case particularly with blues. Chemicals of all kinds have advanced in cost as have also lead, zinc, and other ingredients used in manufacturing ink and colors. It has now come to a point where the job printer must take into consideration the increased prices on ink and charge the same to his customers, otherwise he must bear the loss himself.

At a recent meeting of wall paper manufacturers on the other side, it was reported that there was a scarcity of dark blues and greens which have always been very popular, and that an effort would be made to have yellow and brown papers substituted. Local manufacturers of wall papers report that, while dark blues and greens are hard to obtain and have gone up a great deal, there need be no fear of not supplying these shades for some times. Spring placing orders from dealers have been very fair.

In book, writing, ledger and bond papers, mills are fairly busy. This is naturally the quiet season, but the prospects for fall trade are good. Most of the mills do not care to accept orders for certain colored papers and are making every effort to substitute tints. Envelope producers are rather slack as, according to reports received from Ottawa, since the imposition of the war tax on letters the volume of mail matter posted in Canada has decreased by about thirty per cent.

Mills making kraft paper are busy and prices keep up well, while those plants turning out specialties are active. The brands of greaseproof papers put on the market by one company have taken very well, and orders sufficient to keep a machine busy for a month or six weeks ahead have been booked. All the mills now have plenty of water owing to the recent heavy rains. Ground wood continues quiet as water conditions on the other side have been so favorable as to lessen the number of inquiries and make manufacturers independent in a measure of the wood grinders.

In chemical fibres there is not much change, but importers think, with the advent of fall that there will be additional increases in the price of sulphite. The manufacturers in Scandinavia are meeting with increasing difficulties in getting raw materials. Germany recently raised the ban against the importation of wood pulp and many shipments have been made from Norway and Sweden to that country, thus lessening the amount that can be sent to America. The state of affairs at present is rather uncertain. Canadian plants are pretty well sold up, and there is not much buying going on at present.

In the rag and paper stock market there has been practically no change in the market recently. There is a better demand for over-issues and clean mixed papers as compared with a poor call for this stock all summer. Roofing materials continue to be in fair demand. When the quiet summer season is over dealers in all kinds of rags and paper stock are hoping for a season of moderate trading in all lines.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.90 at mill, in carload lots.
News (sheets), $1.95 to $2.05 at mill, in carload lots.
Book papers (ton lots), 4.25 c. up
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.25 to $3.75.
Manila, B., $2.25 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.00.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $22, delivered.
Sulphite (unbleached), $39 to $44, del. in Canada.
Sulphite (unbleached), $40 to $45, delivered in U. S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.10.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 40c
White blanks, $1.00.
No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ladger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Folded News, 32½c.
Over issues, 45c.
No. 1 cleaned mixed paper 27½c.

Old white cotton, $1.75.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.20.
Black linings, $1.25.
New light flannelettes, $3.75.
Ordinary satinets, 95c.
Flock, $1.05.
Tailor rags, 85c.
Blue overall cuttings, 3.37½.
Manila rope, 2½.
No. 1 burlap bagging, $1.00.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft Pulp, $39 to $40.
Ground wood, $20 to $23, delivered in United States.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine.)

New York, N.Y., August 25, 1915.

The past few weeks have not shown to very good advantage for ground wood pulp. Because of the late rainfalls, the water supplies through New York State were rather well replenished and the newsprint mills all through this section were enabled to operate their grinding machines at a good capacity. Not in many years have the water supplies been so favorable for the paper manufacturer at this time of the year. All of the plants which were able to operate, have been accumulating stocks, so that they will not have to go into the market in the event of a dry season. In consequence of these conditions, ground wood has been in poor demand and grinders have not been able to secure very good prices. No predictions are being made for the future because everything is considered uncertain.

It appears, from the present state of the chemical pulp market, that, if Canada will be able to increase her production she will find little trouble in disposing of a much larger tonnage than is now coming into the United States. The fact that almost all of the local importers are agreed that there will be, in all probability, if the war continues, a scarcity of pulp next year, is responsible for this belief. While the trend of events seem obvious, it is apparent that the paper mills of this country are discounting too freely the acuteness of the situation. With the passing of every week, pulp becomes firmer and the possibilities of buying at lower prices seem to become more and more remote. The Scandinavian mills are so hemmed in with orders that they have advanced their prices considerably, and are now not only disregarding any attempts to buy stock at the old prices, but are even loathe to accept business at the prevailing high figures. The fact is that Norway and Sweden are now the centres of supply for pulp for all of Europe. England is buying heavily and so is France. Italy and Spain are also looking for considerable quantities of stock, and are willing to pay whatever is asked. And now come the latest reports that Germany is in the market for pulp. Evidently, she cannot make enough to meet her own demands, or her mills have slackened up a bit. With all of these countries to supply, it seems plausible to place credence in the letters from Scandinavia which state that the mills are sold far ahead, and that their present stocks are completely drained. It seems that, with this new outlet for her pulp, the Norwegians and the Swedes have entirely disregarded this country, and are sending but little pulp to our shores. Aside from all of this, the costs of manufacturing seem to increase almost continually, and the difficulties in securing raw materials seem to become greater and greater. At the end of the present month, England will place into effect a total embargo on coal, which will make it impossible for the pulp mills to get any coal from the British Isles. So that they will either have to come to America for this article and pay the high freight, or—they will have to close down. It is estimated that a number of the mills will have to do the latter. Sulphur, too, is being shipped from this country, and is being bought delivered at an increased price. Regardless of the circumstances in which the market has just been described, the paper mills insist that a lower level is in sight and are "waiting". The result has been that comparatively little activity has been reported. Just small lots are being purchased. In the meanwhile, the large accumulations which were on the docks several months ago and which were the cause of the weak market which existed at that time, have been gradually diminishing and, at this writing, are said to be less than a good month's supply under normal conditions. Easy bleaching and krafts are soaring very high because of a pronounced shortage in each. Bleached and unbleached sulphite are not very brisk, but are strengthening steadily.

Dealers and packers in rags and paper stock have been waiting in vain for a change in conditions. Do-

mestic rags have shown no inclination to reach a normal level. With the writing mills continuing at an average capacity of about 60 per cent. or less, the market has been greatly reduced and it has little hopes for better business until writing papers are more active. Such a change would reflect directly on rags. The supply of domestic stock is considered low, and there is comparatively little being added to it in the way of collections. At the same time, the imports of foreign rags have fallen off remarkably. This is due to two reasons: first, because prices are so poor here that it would not pay to send stock to this country, and, second, because there is not very much to send over. With these facts before their attention, local dealers are confident that the market will jump sky-high just as soon as there is a little inquiry stirring. Linens are still being sought at a premium, but there is little to be had. Domestic roofing rags have been fairly active at fair prices.

The poorer grades of waste papers improved a little during the past few weeks. This was declared due to a slight upward movement in boards. The box makers generally buy up considerable stock at this time of the year—somewhat of a season's supply. It was the reaction of this which sent the price of old mixed newspapers up a bit. There is a little life in shavings and flat stock. Ledgers do not appear to be in any demand and are rather dormant. Manilas are considered fair for this period of the year.

Bagging, in all grades, is rather brisk. The demand which has come from outside of the paper industry, seems to continue and has, consequently, been partly responsible for the high prices which are now being asked. Aside from this, there is a general scarcity to which can be attributed some of the blame for the present level of the market. Gunny is active at $1.85 to $1.90. Bright bagging is going at $1.45 to $1.55. Manila rope is in good demand at $2.75 to $3.00.

While the general attitude of the paper market has been favorable, there has been no decided changes in the volume of business being transacted. The writing mills have not been able to increase their capacities. However, the reports from the West are still very encouraging. Newsprint has grown firm, and is now in fair summer demand at good prices. This market has been strengthening continually for the past month, or more, and is likely to keep on till the fall, for it is then that a number of the season contracts are made. By maintaining the price, it will be possible to command more satisfactory figures. The settling of the strikes throughout Watertown, last week, will probably set all of the machines in that country in action, and most probably help to increase the tonnage on the market. This is not likely to cause any appreciable effects for some time. Tissues continue very weak. A short time ago, it seemed that they would stiffen a bit, and that there might be a tendency to advance to normal prices, but this was short-lived. The demand for the high grade white tissues is poor. Prices are low, and it is doubtful whether some of the mills are operating at a profit. Manilas are more active, but they, too, are sold at ridiculous prices. The market for krafts has shown no improvement in some time. Since the start of the war, the imports of this grade have been practically nil. It was supposed that this fact would mean a much greater demand for the domestic stock, but thus far, there has been absolutely no tendency in this direction. Reports on manilas are somewhat varying, but it is believed that they are inclining forward. Some mills are going at full time, and are contemplating an advance. Fibres are lifeless, and weak. Toilet papers are in fair demand and are selling at satisfactory prices. Crepe papers too, are seasonable active. Book papers have not yet shown much improvement, but they are tending for the better. It is believed that the gradual increase in magazine advertising will so result in more business for the book mills. Boards took on a little added life under the strain of a little stocking up by the box makers.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., $1.80 to $2.00, delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.60 to 2.90, ex dock, N.Y.
Easy Bleaching, impt., 2.10 to 2.25c, ex dock, N.Y.
Easy Bleaching Pulp from 2.15c to 2.20 to 2.10c to 2.25c.
Unbleached Sulphite, impt., $1.80 to $2.00, ex-dock, N.Y.
Bleached sulphate, impt., 2.75c to 2.85c, ex dock, N.Y.
Kraft Pulp, $1.85 to $1.95

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

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Annual Meeting of Canadian Press Association

The Annual Meeting of the Canadian Press Association held in Toronto a few days ago was full of interest for pulp and paper men. Not only were the sessions of the convention very largely attended but a number of very important questions were discussed by the members. As a matter of fact, it was probably the most important meeting of the Canadian Press Association ever held in the country.

Two of the outstanding questions discussed were the advisability of increasing the subscription price of daily papers throughout the country in order to make the subscription pay for white paper and the cost of production, and the other, the advisability of establishing a School of Journalism in Canada. The first question presented difficulties which the members regarded as insuperable at the present time, but the general concensus of opinion was that the subscription price of the daily papers should be increased from 1 to 2 cents. The second question, the establishment of a School of Journalism in Canada in connection with one or more of our great universities was discussed by President Falconer of the University of Toronto and by several of the leading journalists throughout the country. The tenor of the address was all to the fact that such a school should be established and a strong committee was appointed to look further into the matter.

There is evidently a growing desire for closer co-operation between the publishers of the Dominion and the manufacturers of paper. The two have many problems in common. Both are interested in the conservation of our forests, the labor question associated with production of paper, its markets and many other problems that they have not always been able to see eye to eye in the past is no reason why they should not get together and endeavor to solve the difficulties now confronting them. Co-operation is the new note sounded in business today and should have a place in the policy of the pulp and paper men and the newspaper men of the country.

Research Necessary

Recent developments in Canada, United States and England point to an intense desire on the part of all nations to free themselves from the denomination of Germany in chemical industries. The Canadian Manufacturers Association is working with the specialized organizations of the Dominion to see what can be done to place Canadian chemical industries on a more stable footing, and a new organization of the mental and physical resources of the nation, through the Universities, the chemical and engineering societies, the Department of Trade and Commerce and the manufacturers of chemical products is now under way. Its effects should be very far-reaching.

"We have really never regarded Canada's power as we should", said one prominent investigator recently. "The development of Canada must ultimately depend upon the clever adaptation of our resources. We have the natural wealth, and the progress of young Canadians the world over shows that we have the brains. We have not yet made a close connection between the two."

An example of the development of natural wealth which may be expected in the course of the next few decades is to be found in the project, already very far advanced, to harness up several hundred thousands of horse power at the Grand Discharge on the Saguenay River, for the manufacture of phosphates and nitrates. The chief use for the products will be as fertilizers, but recent economic disturbances have given only a hint of the value of nitrogen compounds in all industries and arts.

Chemical industries in Britain are undergoing revolutionary changes. The introduction of financial backing by the Government and the public at large will give an unprecedented impetus to research and intensive methods of production.

The United States Government has detailed one of its commercial agents, an expert in chemical affairs, to open a bureau in New York for the purpose of stimulating and organizing chemical industries. In a recent interview he said:

"On account of the shortage of chemicals, nearly every industry in the country is deprived of something necessary or desirable. This condition exists in a country with raw material to supply all the needed products, with plenty of capital and with abundant business initiative. We need to coordinate the forces of American resources, American brains and American capital. Among the thousands of chemists and graduates of our technical schools we are looking for a dormant chemical Carnegie to do for the American chemical industry what Carnegie and Edison did for the steel and electrical industries."

The above serve to show how the nations of world outside of Germany are being stirred to action after their long dependence upon German chemists. Undoubtelly the conclusion of the war will see a vastly different attitude among capitalists and Governments towards the development of latent industries.

That Germany realizes this may be gathered from a speech of a German chemist to a gathering of scientific men in Berlin recently:

"German chemical industry will have to take account of the chemical industry in England and in the United States on the conclusion of peace. These countries will do everything possible to ensure success in technical and economical affairs. At any rate it would be very imprudent to rely beforehand upon a failure of these endeavors; therefore it is of the highest importance to follow with attention the development of chemical industry in these and other countries, for at present, as well as in 1893, the words of the "North American Review" are true: 'The country that disposes of the best chemists will be the richest and the most powerful eventually. It will possess the best foodstuffs, the best products at the lowest prices; it will have the best weapons, and the loss of material in the manufactories will be reduced to the smallest proportions possible.'"

Fire Protection

The announcement that the Commission of Conservation has appointed Mr. J. Grove Smith, B.A., B.Sc., chief of the statistical department of the Canadian Fire Underwriters' Associaton, to make an exhaustive study of the cause and effect of Canada's fire loss will be received with satisfaction everywhere. The insidious causes of fires which run up losses of hundreds of millions annually are not well enough understood. For this reason, the investigation of Mr. Smith should be supplemented by some active educational work. Fires in the city, like fires in the forest, will never be reduced until the personal equation has been solved, until citizens have a clear understanding of the difficulties of working against fire losses.

An interesting development of the fire protection propaganda in the United States has been the setting aside of a day (October 9th of this year) as "Fire Prevention Day." Surely twelve hours is a not too large a space of time to devote to the serious consideration of fire problems. If, with our present carelessness, insurance companies demanded as small a percentage per annum on fire risks, they would be out of business in a week.

Let us have fire prevention education, and, for the sake of our basic industries and of all who are engaged in them, let us have that education applied not only to buildings, which can be rebuilt in a few weeks or months, but to our forests, which can not be restored in a lifetime.

Paper Industry Suffers Loss

Sir William C. Van Horne who died at the Royal Victoria Hospital on Saturday afternoon following an operation, was one of the best known men in the Dominion. He was the first General Manager of the Canadian Pacific Railway and its second President, while throughout the past thirty-three years, or ever since he came to Canada, he has been actively associated with the Company's affairs.

In the pulp and paper world Sir William was as well known as he was to railway men. As President of the Laurentide Company he deserves the most unstinted praise for having brought that company to its present high state of efficiency. Sir William was always keenly interested in conservation and in the proper utilization of the country's resources and being possessed of more than usual shrewdness and foresight he early placed the Laurentide Company in a position to take full advantage of the possibilities of the country as a pulp and paper producer. The report of the Laurentide Company, published elsewhere in this issue and the reference contained therein to its future power possibilities indicates something of Sir William's activity in connection with this important industry. The Pulp and Paper industry has lost one of its strongest pillars, and the business interests of the Dominion mourn an outstanding figure.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action, Feb. 28th, 1915.
WM. SMITH.
WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
GEO. ALBERT BROWN.
C. V. PERRY.
Sergt.-Major E. C. MORRIS.

Bird and Son.

JAMES BOATH.
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GILDDEN CAMPBELL,

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford and Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.
THOS. B. FORD,

Kinleith Paper Company, Limited.

Capt. C. STEWART-PATTERSON.
GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

The Laurentide Company, Limited.

M. JEAN ARHAN.
M. FRANCOIS DARCHEN.

Canada Paper Company.

Lieut. F. C. H. TYRON.

Price Bros. and Co., Limited.

G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. AMY, Jr., killed 31st May.
E. LEDGER.
A. BERNIER.
H. A. MOAT.
J. C. EAGLES.
J. HOOD.
S. HARTLEY.
G. LANE.
R. DONCET.
C. CONLEY.
S. LAPIERRE.

St. Croix Lumber Co.

FRED BOUCHY.
CLIFFORD WHEADON.
BERT McMULLEN.

St. George Pulp and Paper Company.

HARRY HEWITT.
GORDON GRAY.
ROBERT GRAY, Jr.
ARTHUR HATT.

Spanish River Pulp and Paper Mills, Limited.

L. FINCH.
W. P. L. FOOT.
OLIVER DENMAN.
M. L. COTGRAVE.
F COLLINS.
M. L. COTGRAVE.
A. F. BRADLEY.
C. MARTIN.
HOWARD N. REID.
P. VENN.
GEO. WICKENDEN.
HAROLD LOCKWOOD.
D. CLEARY

Toronto Paper Manufacturing Co., Limited.

ALLEN FORBES.
JOHN GIRARD.
MIKE COLBORNE.
Z. MARTIN.

The E. B. Eddy Company, Limited.

F. T. SEAR.
A. F. CLARKE.
WILLIE SMITH.
EDWARD LONGPRE.
ALPH. FOURNIER.
A. BRANCHAND.
EDWARD PERRY.
J. C. FARISH OWEN.
THOMAS OUELLETTE.
LEANDRE CHEVRIER.
E. S. HUBBELL.
JOSEPH DESORMEAUX.
THOMAS ALBERT KELLY.
J. E. FRASER.
CHAS. COVELL.
EDWARD COLLINS.
ISODORE GAUDREAU.
OVILA FOURNIER.
GEORGE MORRISON.
WILLIAM CRAIG.
W. S. GOODEVE.
HARRY FRANCIS.
HERBERT LOVE.
JOHN MOORE.
JEAN DESJARDINS.

MacLeod Pulp Company, Limited, Liverpool, N.S.

Sergt. R. D. BROWN, 1st Clearing Hospital.
SAMUEL MANTHORN.
FARQUHAR McRAE.

Howard Smith Paper Mills, Limited, Montreal.

J. KEELY, 60th Battalion, Valcartier.

Northumberland Pulp Co., Limited, Campbellford, Ont.

EVERETT SWEET, honorably discharged.
ARTHUR LLOYD.
ALEX. HANNA.
ALF. HUTCHINGS.
EVERET COULTER.
WALTER SCOTT.
HERB. PRYKE.
JACK CALLAGHAN.
JACK RAY.

National Paper Company, Limited,

JOHN NEIL, Jr., 24th Battalion, Shorncliffe, England.
WILLIAM ROBERTSON, 60th Battalion, Valcartier.

Provincial Paper Mills Co., Limited.

Barber Division.

A. B. C. HERBERT.
THOS. THEO. NELLE.
HERMAN NELLE.
HENRY W. FRANCIS.
JOHN PEACE.
FRED McCARTNEY.
A. SLEIGHTHOLME.

Montrose Division.

H. HALLAM.
J. HURLEY.
W. TAPP.
F. TROWBRIDGE.
MIKE CORTELLEJA.
CHARLES GASPRE.

St. Lawrence Division.

SANDY BEDFORD.
ERNEST BEDFORD.
EDWARD DEMEREST.
JOE DEMEREST.
ERNEST BROWNELL.
VINCENT EAST.
WILLIAM MANSON.
GERALD MANSON.

Lincoln Paper Mills Company, Ltd., Merritton, Ont.

PERRY RICHARDSON.
HENRY HOOKINGS.

LAWRENCE BRADLEY.
LOUIS O'NEILL.
ERNEST WATSON.

Wayagamack Pulp and Paper Company, Limited, Three Rivers, Que.

R. A. GILLIS, 3rd University Co., McGill Battalion, C. E. F.

Ritchie and Ramsay, Limited, Toronto, Ont.

JAS. COCHRANE, Jr.

Rolland Paper Company, St. Jerome, P. Q.

JEAN HAMEL, 22nd, R.C.F.
HENRI PARET.

The Dryden Timber and Power Co., Ltd., Dryden, Ont.

LESLIE V. BISHOP, Corporal Chemists' Corps, Royal Engineers.
A. J. LOCK—"D" Company, 52nd Battalion, C.E.F.
E. H. TOYNE—"D" Company, 52nd Battalion, C.E.F.
Sergt. J. JOHNSON—"D" Company, 52nd Battalion, C.E.F.
LESTER L. LEARMONTH — "D" Company, 14th Battalion, 1st Contingent, C.E.F.
RICHARD CURRIE—2nd Artillery Brigade, C.E.F.

Montreal Paper Company.

A. L. BISHOP—2nd Battalion, 1st Contingent, C.E.F. On firing line since February.

Canadian Leather Board Co., Ltd.

JAMES HARTLEY—2nd Contingent.
WILLIAM HALE—2nd Contingent.

Bathurst Lumber Co., Ltd.

ALEC YOUNG—26th Battalion.
RAYMOND LOZIER—55th Battalion.
ALPHONSE ROBICHAUD—55th Battalion.
MAURICE RIX—55th Battalion.
DON. CRAFT—55th Battalion.
J. L. DOUCETT—55th Battalion.
JAMES COLLINS—55th Battalion.
ANGUS BUCKLEY—55th Battalion.

Foley-Rieger Pulp and Paper Company, Limited.

JOHN THOMAS HENRY—44th Regiment.
JOSEPH COOPER—44th Regiment.

Victoria Paper and Twine Company.

A. S. HASSALL, 39th Battalion.
H. C. DUNNING, 6th Field Company, Canadian Engineering Corps.
COL.-SGT. HAROLD DUNN, 20th Battalion.

Powell River Company.

British.

RICHARD WELCH.
GEORGE WASHINGTON.
D. SUTHERLAND.
E. PEACOCK.
A. F. McBRYER.
ROD McAULAY.
R W. LOMBARD.
THOS. FRASER.
W. D. DOYLE.
J FALCONER.
J. COLE.
G. E. COLE.
T. ALLSWORTH.
JAMES CLAPP.
H. A. CARTER.
WM. STANLEY.
JACK BANHAM.
DAVE WILSHIRE.
A. V. GILLINGHAM.

French.

AUGUST SLOSSA.
J GAGNON.
LEWIS SLOSSA.
ED. BAGHUM.

Russians.

MIKE ZUTZ.
MIKE ZUKOFF.
A. ZORATH.
R. ZOKOFF.
GUS ZOCOFF.
A. VANOFF.
TOM VADIFF.
B. VADIFF.
M. VADIFF.
BORIS URTAEFF.
M. TORCHING.
M. TARIEF.
S. TAGOFF.
M. TAGOFF.
ALEC. SOLOFF.
B. SERCOFF.
N. NUMSUROFF.
MAX FIDAROFF.
R. DYEBOEFF.
M. DOEFF.
JAS. CHET.
JOE CARVER.
C. MIKE.
ALEC. KUGOFF.
M. MALIFF.
A. KUBALOFF.
V. KOZOFF.
ALEC. KOOTENZO.
C. KOOBLOFF.
A. KAROFF.
GEO. KAROFF.
J. KAPALF.
M. KANOFF.
JIM KARDIFF.
M. CAROFF.
MIR CAROFF.
J. CADIFF.
J. GOODENOFF.
ALEC. GILOFF.
A. FIDAR.
A. DIGNROFF.
ALEC. DOEFF.
A. CATIEFF.
PETE BAZIEFF.
M. ALICOFF.
G. KAMEROFF.
ALBERT KAMEROFF.
JIM JUBULOFF.
A. MURMEROFF.
I. NUDALOFF.
MIKE HAMEROFF.
M. NODOFF.
MIR NODOFF.
B NODOFF.
M. KANOFF.
A. NADZARAGOFF.
G. GUBIEFF.
A. GOSOFF.
M. GODIFF.
MIKE FRAY.
ALI ELLOFF.
S. DOEFF.
J. COROFF.
J CAROFF.

Belgians.

O. PERSON.

Italians.

B. SANTO.
L. BAZZANI.
F. PARON.
A. PARON.

ADDITIONS TO HONOR ROLL SINCE LAST ISSUE.

The Foley-Rieger Pulp and Paper Company, Limited.

ROBERT E. BARRY, 44th Regiment.
CHARLES BESSEY, 44th Regiment.

Edwin Crabtree and Sons, Limited.

WALTER R. STAFFORD, 42nd Highlanders.

Interlake Tissue Mills, Limited.

R. McCANN,
F. NILES,
M. HOPKINS,
P. RICHARDSON.

The Belgo-Canadian Pulp and Paper Co., Limited.

ROLAND COMTE (Order department)—Rejoined his regiment in France, now prisoner of war in Germany.

ANDRE SYSTERMANS (accountant)—Rejoined his regiment in Belgium; killed in action at Gyseghem (Belgium) Sept. 24th, 1914.

LEONARD DEVENYNS (Chief of Forestry Division)—Since beginning of war was appointed Commander of Recruits in Belgium. Fought in several battles and was decorated by King Albert for gallantry. Has now returned to his home at Van Bruyssel, P.Q.

G. BATES (clerk in shipping department) — Private 60th Regiment, Canadian Volunteers.

EDOUARD CURTET (laborer in paper mill).—Rejoined his regiment in France.

G. GOLDTHORP (laborer in paper mill).—Left with First Canadian

THE MICROSCOPE IN PAPER MAKING

By E. SUTERMEISTER.

(Written Specially for Pulp and Paper Magazine.)

But few persons not connected with the technical staff realize the important part which the microscope plays in the investigations conducted by the paper mill chemist. Many think of it merely as one of the mysterious instruments of a still more mysterious profession, while still others realize that it enables one to see small objects more distinctly yet fail to understand that a compound microscope is far more powerful than a simple hand lens and is, in fact, quite a different instrument. The hand lens is very useful for certain purposes, but its magnifying power is comparatively limited, and in every well equipped mill it should be supplemented by a good compound microscope. This does not necessarily mean an expensive instrument for one entirely satisfactory for the work which it has to perform can be obtain for $50.00 or less. The magnification required for most paper mill work is less than 90 diameters, but higher powers are occasionally required and it is advisable to obtain an equipment which will permit of magnifying an object 350 times. A combination of lenses which will give this range will include objectives of 2-3 and 1-6 inches (16 mm. and 4.2 mm.) and eye pieces of 1 and 2 inches rating (25 mm. and 50 mm. The microscope stand should be of standard construction, so that additional parts may be added as desired, and it should preferably be fitted with a substage condenser and iris diaphragm to ensure the proper illumination of the object. If it is desired to make measurements of the size of fibres or other objects an eye-piece micrometer should also be included. Such an equipment as this will serve nearly all the needs of paper mill work, and the simple rules for its care and manipulation may be readily learned from any one of the numerous text books on the subject.

The most obvious field of usefulness for the microscope, and the one in which its services are most frequently in demand, is in the examination of the fibrous materials which are used, or proposed for use, in paper making. In the case of a new or unknown fibre, the microscope will sometimes reveal its source, but in any case it will enable one to judge, from its similarity to known materials, what the probabilities are as to its paper-making qualities. It is easy to distinguish by the eye the relative length of fibres, but only the microscope will give reliable information as to their width, the thickness of the cell walls, the way they taper toward the ends, their ability to break down into fibrillae, the relative abundance of pith cells, etc., all of which have an important bearing on the paper-making value of the material. By having a thorough knowledge of the types of fibres in general use it is frequently possible to form a pretty accurate judgment of the nature of the paper which a new fibre will give.

Closely connected with this line of work is the analysis of paper for its fibre constituents. This very important feature of microscopic work involves a study of the structure of the common types of fibres as well as the use of numerous stains and mounting media. A comprehensive description of the methods employed would make the present article unduly long and such a discussion must be postponed until some later date.

In addition to the fibre composition of a paper, the microscope enables one to form a fair estimate of the nature and amount of treatment the stock received in the beater. For some papers the fibres are cut quickly with sharp beater bars, and in such papers they are found to be short and cut squarely across on the ends, as though with a pair of shears. Other papers must be strong, firm and hard, and for these the stock is beaten for a long time, while the roll is lowered gradually. In such papers the fibres would be quite long, but the ends would be split and frayed out like an old broom. The extreme of such beating is illustrated in paper made from hemp, which probably splits lengthwise more easily than almost any other fibre; in certain of the papers made from this material the beating is carried to such an extent that it is practically impossible to find a piece which shows the full diameter of the original fibre. Information of this sort as to the nature of the beating in a sample which has to be duplicated is of great assistance in enabling the desired result to be accomplished without undue loss of time or expensive trials.

This study of beating, if carried a little further by actually measuring the length of the fibres with an eye-piece micrometer, gives valuable indications of the efficiency of different types of beaters, of the same beater at different speeds, of the rapidity of reduction at different roll settings, etc. This method is, however, tedious because of the necessity of measuring a considerable number of fibres in order to get a fair average. It also has the disadvantage that the personal element plays an important part in the selection of the fibres to be measured. For these reasons it is not very frequently used in investigations, yet it occasionally renders valuable service.

Dirt in paper is a frequent source of worry in a paper mill, and in detecting the cause of the trouble the microscope is of great assistance. As the material to be examined in such cases is readily visible to the naked eye, comparatively little magnification is required and the low power objectives and eye-peices should be used. Among the frequent offenders are coal dust, cinders, shives, slivers of wood, bits of iron and brass, rubber, slime from dirty chests and pipes, rosin spots, unreduced coated or plain waste papers, etc. Coal and cinders may usually be detected by their brittleness and color when crushed; they should be compared for color, hardness and structure with the coal used and with cinders collected from some sheltered place on the mill roof. Shives and slivers of wood may be stained with iodine or with the ground wood reagent, phloroglucin; their structure will then tell whether they are derived from the sulphite fibre, from slivers of soft wood removed from the stock cars, when furnishing, or from the hard maple paddles used around the beaters. Rosin spots may be stained by Orcin solution, when their orange-red color makes them readily distinguishable. Lumps of coated paper, due to the use of highly waterproof coated waste, can be brought out by staining with dilute iodine solution or by Millon's reagent; the former gives them a yellow color, while the latter turns them red. Many other kinds of dirt occasionally appear in paper, but it is seldom that the microscope cannot be used to good advantage in tracing them to their source.

Occasionally a sample of paper is received with the request that it be looked over to see if it is coated, plain or printed. The microscope nearly always gives the answer, though it is generally confirmed by chemical tests. We can also tell by the microscope whether a paper has been tinted with ultramarine, whether the coating is smooth and of good quality or is full of fissures, scratches and froth-pits, whether the pin holes in a tissue are due to froth or to gritty filler, etc. From the nature of the coated surface, as revealed by the microscope, it is often possible to tell whether a paper will print well or poorly, and some idea of the amount of ink that will be required can be obtained by noting whether the surface is smooth and enamel-like or more or less porous and absorbent.

Printed samples of paper are often returned to the manufacturer with complaints that they do not print well, are dirty, etc., and here again the microscope proves of service. One of the most frequent troubles is picking, or the pulling off of small particles of coating by the tacky ink. This is often confused with white spots on the printed surface occasioned by the presence of dirt on the plates, but if the surface is examined by the microscope, the difference is at once evident, the true "pick" showing the fibrous body stock through the ruptured coating while the spots caused by dirty plates leave the coating homogeneous and intact. To go still further, it is even at times possible to tell the nature of the dirt which caused the spots; fuzz generally gives a long spot with a hair line down its centre where the fibre touched it; trimming dust gives irregular-shaped spots with occasional bits of the dust adhering; sand or grit leaves dents in the surface; water accidentally sprayed on the paper or plates gives nearly circular spots with smooth edges, etc. At times an uncoated paper may show an effect very similar to picking, because of the presence of small These bits of froth are particles of dry froth which break away from the head-box of the machine and become incorporated in the surface of the paper during its passage over the dryers and through the calendars, not an integral part of the sheet and are readily removed by the printing ink.

Microscopic examination of the printed sheets shows whether too much or too little ink was used, that is whether an excess of ink remains piled up around the half-tone dots or whether the surface is insufficiently covered. If a double-tone ink has been used it shows the extent of the spread of the secondary color, and this, if wanted for comparison or record, can be actually measured by means of the eye-peice micrometer. The way the ink takes on the paper is also shown. some "creep" or draw together unevenly, giving irregular distribution, others, as in the dull finish papers, strike into the paper quite completely, while still others leave a uniform film on the surface. It also enables one to locate the cause of gray streaks in a black cut; these are frequently laid to brush marks, which is true in a way, for the microscope shows that long lines of froth pits follow the bristle marks, and as the ink does not fill them they appear gray.

Apart from the paper itself, nearly all of the raw materials which go into it will yield valuable information when examined microscopically. In many cases it is not necessary to do this as a routine operation, but in doubtful cases its evidence is frequently conclusive. A few of the many uses to which it can be put are as follows:—

Samples of fillers are frequently received which are too small for an accurate grit test, but if they are compared microscopically with known samples, tested in the regular way, a fairly good opinion of the new sample may be formed. The nature of the grit, whether rounded, needle-shaped or sharply angular is readily determined, and an opinion formed of its effect on the machinery and wires. Apart from the grit the appearance of the rest of the filler is generally quite distinctive and gives a good indication of the value of the material. In the case of many of the artificially prepared calcium sulphates, as well as some of the natural ones, strange claims for peculiar crystalline structure are often made. The microscope will at once show which of these are justified, and which are not. This same statement holds true for the minerals sold under the names of asbestine, nevadite, talclay, etc.

While not strictly a filler, starch is often used in the beaters and for the examination of this material no instrument is so essential as a microscope. Each kind of starch has a definite size and shape of grain from the large, oval potato starch to the very fine, angular, rice starch. The experienced microscopist is seldom at a loss to determine the kind of starch submitted, and as each kind has certain qualities this frequently determines the use to which it may be put. Having determined the proper kind for any given purpose the microscope again proves invaluable in ascertaining that the supply is kept free from adulterations. In an unknown sample of paper it will also show whether the starch used in the beater was raw or cooked, and whether it was applied throughout the paper or only as a surface sizing.

In the study of size emulsions the high powers will indicate the relative sizes of the particles of free rosin in suspension. As the sizing efficiency is generally claimed to increase as the particles become smaller, and as the small particles stay in suspension better, the test is of use in showing the relative value of different emulsions.

When testing casein, it is frequently observed that there is a residue of insoluble white flakes when the casein is dissolved in alkali. For a long time these baffled all attempts to determine their nature, but finally on examining with a high power microscope they were seen to be due to mould growth, the mycelia and spores being plainly discernible.

In research work the microscope is of very frequent use in corroborating other observations or in supplementing them. An example of this is its use in studying the degree of cooking of soda poplar by noting the structure of the ends of the fibres; it has been used for this purpose in the Forest Service of the United States Department of Agriculture. A little different line of research is that recently undertaken by the writer; this consists in studying the penetration of printing ink into coated paper, and the penetration of the adhesive used in the coating into the body stock, by means of sections cut by a microtome and examined under the microscope.

This enumeration of uses to which the microscope can be put in a paper and pulp mill is not intended to cover the ground completely; that would obviously be impossible in a short article of this nature. It is, however, hoped that these few observations may prove of interest and assistance, at least to the novice.

(To be Concluded.)

THE MANUFACTURE OF HIGH-GRADE SULPHITE PULP

By L. WIMMER

Appleton, Wis.

(Written Specially for Pulp and Paper Magazine.)

II.—COOKING SULPHITE PULP.

In cooking sulphite there are three important points, dry steam, good wood and the right kind of acid.

In my experience I have found that almost any kind of wood can be cooked if only the different kinds are separated. For instance when dealing with a supply of green wood the safest way is to cook it by itself and not get it mixed with dry wood. If there is, for instance, one third of wet and two thirds of dry wood in the digester, at the end of the cooking process the acid will turn brown. The dry wood is cooked and the wet wood remains uncooked, causing uneven stock. On the other hand when using three quarters wet wood and one quarter dry wood the acid in the digester, if the cooking has been carried out properly, will not turn brown until all the wood is cooked, thus producing good pulp. The safest way however, is to keep the wood separate.

The writer has seen a number of mills making good pulp while using dry wood, but as soon as spring opened up the fresh cut wood from the river was used and all of a sudden the pulp produced was hard, the digester did not blow clean and a number of other troubles arose. Some mill men would say that "every mill has hard luck once in a while" or something to that effect, but most men with experience know that there is no such a thing as luck in making good sulphite pulp. For every digester of hard stock there is always a reason, and if the acid is of the proper strength, the reason can generally be found in the circulation, especially when cooking with large digesters and wet wood.

To get the proper circulation when using green wood especially on large digesters a good plan is not to pack the digester too full of chips. About four or five feet of space at the top should be enough in any digester to get the proper circulation. No definite rule can be laid down, as digesters are of different sizes and every digester acts differently, even in the same mill, but if the cooks just find out how much chips and acid can be put into the digesters to get the proper circulation, there will be good results. Make a rule and follow it and soon there will be no more trouble cooking green or wet wood. Always keep in mind that there should be in any case about the same amount of acid in a digester as chips. A little more acid than chips is better than a little less acid than chips.

In case of using low pressure steam, which is not as dry as high pressure steam, a little less acid than chips should be used, thus getting the temperature of the digester to the right point when the pressure is up.

When using high pressure dry steam, more acid should be used, thus preventing over-heating, when the digester is brought up to pressure, which saves the fibre.

Indications when circulation is lost.

..The pressure always jumps up quicker at the start with the same amount of steam used, and if there is a thermometer on the digester cover it will be found that it rises fast up to 120 deg. to 140 deg. Centigrade.

Another point is more gas on top than usual. When a cook finds he has lost his circulation the proper thing to do is to shut steam off for 15 or 20 minutes, try steam again by opening full line for several seconds and closing again. This might be repeated until the circulation is good, but if this does not help a good plan is to bring the digester up to pressure, let off the gas slowly from time to time until the acid reaches the top and then shut the steam off for a couple of hours and cook slower. This will in many cases save the pulp but not always. In my experience I found that it is very hard to spoil a digester of stock if the digester circulates well and the acid and wood are right.

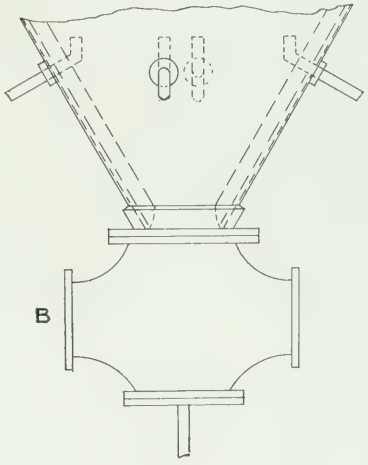


Fig. 1

A great help in cooking and to get good circulation is to run or pump the acid into the digesters from the bottom instead of the top. By the former the chips are loosened at the bottom and there is always circulation when turning on the steam, while when running the acid in from the top the chips are packed down and circulation is harder to get. By carefully using and keeping the valves in good condition, filling a digester from the bottom is a pleasure compared with filling from the top. Moreover time can be saved as in many cases the acid pump can be started before the digester is full of chips.

The pulp produced without proper circulation in the digester is generally a mixture of raw white and black burned chips. The raw chips are caused by the steam working through the centre of the digester and not reaching the sides properly. Thus the chips not cir-

culated are raw. The black chips are on top burned by the steam and heat before the acid reaches the top.

Lime is very often found at the bottom of digester neck especially in the summer time. There are many reasons for the digester liming up at the bottom. If

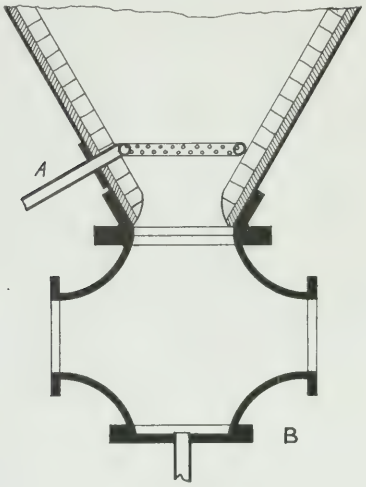


Fig. 2

the acid is right, that is, if the combined SO_2 Calcium Oxide is not over 1.20 p.c.; if high magnesia lime is used and the towers kept clean, the reason always can be found in the steam entering the digester neck. In my experience I found digesters with large necks seldom lime up. The reason probably lies in the friction caused by the steam and acid while cooking on the walls of the neck, when it is smaller. The friction on a large neck is less and there is consequently no lime.

In one mill after blowing off, about 1-2 hours were lost on nearly every cook because of the necessity of cutting lime from the neck. The digesters were 15 x 45 Portland make, the steam entering was divided into five lines, four 11-4 "lines reduced down to 7-16" wide before entering the digester near the cone as per figure 1. I simply put a 1" line at the end B and closing the bottom steam entirely and the line stopped. In another mill using 15 x 46 Manitowac digesters the main steam entered through a steam ring A (Fig. II) and 1 1-4" line at the bottom B. It was customary to use both lines at the start; the digesters kept liming up at the bottom till the superintendent suggested not to use the bottom steam B until the digester is up to pressure (at least 60 lbs) and 90 deg. of Centigrade. This suggestion was carried out and the lime stopped. By this action it is shown that the lime forms in the bottom at the beginning of the cooking before the digester is up to at least 60 lbs., pressure and 90 deg. heat Centigrade. A very good way to cook large digesters is to have two lines, one at the bottom of the digester neck and the other at the end of the neck. Both are turned on and each steam jet striking the other forms perfect circulation and allows no lime, but the best way is to have from six to eight limes (generally about 1-2") enter the digester just below the cone and 2" line at the end of the bottom, also another at he bottom of the digester for reserve in case the end steam should plug up during the cooking process. This last arrangement is especially adapted for large digesters. It helps to get better circulation, more chips can be put into the digester and they generally blow clean. Furthermore, quicker cooks can be made.

(To be continued.)

THE EVOLUTION OF PAPER MAKING INDUSTRY IN CANADA

(Written Specially for Pulp and Paper Magazine.)

The great strides, that have been made in the line of paper-making in Canada, are called to mind by the accompanying advertisement, which appeared in "The Times" of London, England, a little over half a century ago,—May 26, 1854. Contrast the materials then used with the present day substitutes employed in the industry, which has made the Dominion of Canada the great pulp country that it is. In 1914, the total production of pulp wood in Canada was 2,196,884 cords, valued at $14,770,358, of which 1,224,376 cords of the value of $8,089,868 were consumed in the sixty-six active pulp mills of Canada, and 972,508 cords, valued at $6,680,490 were exported. In 1914, the wood pulp exported aggregated $8,865,436, of which $4,509,260 was mechanical pulp and $4,356,176 chemical pulp.

The interesting announcement offering "1,000 Pounds Reward" hangs in an oak frame in the head offices of the Provincial Paper Mills Co., Limited, Toronto, and recently came into their possession in a rather unusual way. It appears that the Red Cross Society of London, Eng., was asking for some old prints and, among the number received was this advertisement. Along with other ancient documents, it was sent to K. J. Dunstan, manaer of the Bell Telephone Co., who is secretary of the Red Cross Society in the Queen City. When he opened the package he discovered that there were several copies, one of which he presented to I. H. Weldon, President of the Provincial Paper Mills Co., and President of the Canadian Pulp and Paper Association. So pleased was he to secure this historic souvenir of the paper trade, that his company, although they had already given liberally to the Red Cross and other patriotic funds, promptly paid a hundred dollars for it. Another copy of the old print is in the hands of George A. Howell, of the Howell Trading Co., Toronto, who has it for sale for one hundred dollars, and the fortunate purchaser will be made a life member of the Red Cross Society.

The employment of wood pulps, which now constitute the largest proportion of Canada's output, did not come into effect in this country until after 1860.

Angus, Logan and Co., which firm some years later became the Canada Paper Co., Ltd., established in 1864 what they claim to have been the first soda pulp mill in the Dominion, and the second in America, on the St. Francis River at Windsor Mills, Que. This was followed a few years after by the erection of a

soda pulp plant by William Barber and Bros. at Georgetown, Ont., with three small digesters. The third soda pulp plant was established by the Thomson Paper Co. at Newburgh, Ont. To-day the only soda pulp plants operating in Canada are that of the Canada Paper Co. and the one at Georgetown, now operated by the Provincial Paper Mills Co., who, about three years ago, purchased the Barber mills.

In 1888, the first sulphite pulp plant was established in Canada a t Cornwall. Subsequently a similar plant was erected at Merritton. The third was started by the E. B. Eddy Co. in Hull, Que. The first Canadian who went to Europe to examine into the process of making sulphite pulp was Charles Riordon, now President of the Riordon Pulp and Paper Co., Montreal. The Riordons had built a paper mill at Merritton, Ont., in 1863, and in the spring of 1886, Mr. Riordon went to England and Germany. He visited the Partington mills at Glossop, some twelve miles from Manchester, and the sulphite mills at Mannheim, situated on the Rhine. In November of the same year John R. Barber, President and Managing-Director of the Toronto Paper Mfg. Co., who had established a book and writing mill at Cornwall in 1882, having heard and read a great deal about the respective merits of the Partington and Ritter-Kellner processes, took a trip abroad to study both systems and decide which it would be advisable to adopt at Cornwall. He spent ten days at the Kellner mills at Podgora-Goritzia in Austria, (where severe fighting is now going on), and a week at the Partington mills at Glossop, England. On his return home he made an exhaustive report on the respective merits of both systems, to the board of directors of the Toronto Paper Mfg. Co., of which Charles Riordon was Vice-President, and one of the founders along with his life-long friend, Mr. Barber. The result was that the Board decided in favor of the Ritter-Kellner process, believing it an improvement upon the original invention of C. D. Eckman, the Swedish chemist, who had applied the process at his Bergvik mill in 1874. The erection of the sulphite mill at Cornwall was begun March, 1887. The construction and equipment of the plant cost in the neighborhood of seventy thousand dollars. Two digesters, orders for which had been placed by Mr. Barber at Duisberg, in the event of the Toronto Paper Mfg. Co. deciding on putting in a plant, were installed, and the company cooked their first digester on May 5, 1888. Each of the digesters had a capacity of about five tons of dry pulp per day, the cooking being longer and stronger than at the present time, occupying from sixteen to eighteen hours. The wood working machines were secured from Vienna.

The Partington process consisted in putting the pulp wood chips in a rotary digester of about a ton and a half capacity and using burnt lime for cooking, the chips coming out in the same form as they went in before being boiled. After the cooking, by opening the bottom valves of the digesters, the chips were blown out. The chips, impregnated with steam of 70 pounds pressure or over, were then placed in macerating machines to separate the fibres of the cooked sulphite pulp.

By the Ritter-Kellner method, so-called after Baron Von Ritter, who put his money in the enterprise, and Kellner, the inventor of the process, upright digesters of about five tons capacity each were employed, with magnesia limestone used for the cooking, the liquor in both processes being practically the same.

So far as the profitable and successful production of sulphite pulp is concerned, it is believed that the plant at Cornwall was the first undertaking in America, although experiments had been carried on for some years previous on the other side of the line. The reason that the Toronto Paper Mfg. Co. adopted the sulphite process was because it was stronger and more economical in the making of book, bond and writing papers than soda pulp and rags, which had been used up to that time.

The next sulphite plant established in Canada was by the Riordons at Merritton, which was built and put in operation shortly after the one at Cornwall. Mr. Charles Riordon, as already stated, was the first to investigate the system. He was associated with Mr. Barber in sulphite investigations in what was then known as the Canadian Sulphite Co., of which he was President and Mr. Barber, Vice-President. On his first trip to Europe in the spring of 1886, Mr. Riordon was accompanied by his brother-in-law, Capt. Harry Ellis, a well-known voyager. The latter remained abroad for a year or more to study the process of sulphite pulp making. On his return to Canada he went first to Cornwall and then to Merritton to take charge of the installation of the sulphite mill of the Riordon Company. In 1888, and in 1889, and thereafter at intervals, Mr. Riordon visited Germany, generally in company with C. C. Springer, Secretary

of the Russell Sulphite Company of Boston, then known as the American Sulphite Company.

In the beginning of sulphite work in Canada many difficulties had to be overcome, the chief of which were in the digester linings and acid making, but, after a few years, most of these troubles were mastered. To-day the Riordon Pulp and Paper Company, with their plant at Merritton, which has a capacity of thirty tons per day of easy bleaching sulphite, and their mill at Hawkesbury, Ont., established some years later, which now has a daily output of 150 tons, are the largest producers of sulphite pulp in the British Empire.

As already stated, the third sulphite plant was inaugurated by the E. B. Eddy Co. of Hull, of which George H. Millen is now President and Manager. He has been connected with the Eddy Company ever since 1866, when he came over after taking part in the American Civil War, to repair and take charge of a small saw mill, which Mr. Eddy had rented. He has seen the plant grow, from a comparatively insignificant beginning to its present magnitude in the pulp and paper world, with twenty-five branches and an army of 2,500 employees. Mr. Millen says that the Eddy Company started to build the foundation of their sulphite mill on March 22nd, 1889, and turned out their first sulphite pulp on December 16th of the same year. When first started with four digesters, using the Mitscherlich process, this plant was supposed to produce ten tons per day. The company, however, kept increasing the output with the same four digesters until they got up to an average of twenty-two tons per day the year round. They could not supply the demands for their sulphite, and in the spring of 1900 they started to build another digester, which was one of the largest made, and the following spring,—they had this digester installed as well as the latest machinery for the manufacture of sulphite, increasing the production of the company to fifty tons per day. Mr. Millen states that, on December 16, 1914, they had been manufacturing sulphite for twenty-five years and, during all that time, steam has never been turned down on their steam boilers. The firm use all the screenings and culls from the plant in making binder board and other heavy board for strong shipping cases. All the men of the Eddy Co. have learned the business at home, and never worked in any other pulp mill. Many have been with the company since the sulphite mill was started. Other employees in the paper, match-making and other departments of the business, have been in the service of the late Mr. Eddy and the Eddy Co. for sixty years.

THE FRENCH PAPER TRADE

SUSPENSION OF THE DUTY ON NEWS AND WOOD PULP APPROVED BY THE FRENCH CHAMBER.

In the French Chamber of Deputies recently a lengthy debate recorded in "The Paper-Maker and British Paper Trade Journal," took place upon the report of the Committee on Customs Duties recommending for reasons of national defence that suspension of the duty on news and wood pulp employed in making "news" paper. The report stated that the Press was more than ever in a position to serve the national interest. It was not a question at present of the price of paper; the question was whether it was obtainable at any price. There was no stock of "news" in France and the mills were incapable of supplying the demand owing to the lack of labour. Therefore it must be obtained from outside.

In the course of the discussion upon the proposition of M. Ringuier for the total but temporary suspension of the French Customs Tariff on newsprint and wood pulp, M. Failliot remarked that in February, the reduction of the Customs Tariff on paper from 10 francs to 4 francs (60 per cent.) had been decreed by the Minister. Paper then cost 38 francs; before the war, it stood at 30 to 32 francs (per 100 kilos). It now cost 40 to 42 francs. Since February only about 800 tons had been imported. Commercial relations were now being entered into with Canada, Sweden, and Spain, with a view to increasing these importations. The above figures, M. Failliot pointed out, were quoted from M. Ringuier's report. M. Ringuier alluded to the French paper trade as a sort of "trust," but a perusal of the reports of the paper-makers' annual meetings for the last half century would dissipate this idea. On the contrary, keen competition existed. Manufacturers might settle minor points of trade interest in a friendly way, but they had never been able to agree even as to the cost price of a given quality of paper. He (M. Failliot) thought the real question was not the scarcity but the price of French paper. Why should paper-makers be selected for exceptional treatment? If, when any article became too dear, Customs barriers were to be removed, let the system be applied to all industries alike; and not to this one in particular.

M. Renandel said this was done, for raw materials.

M. Failliot said that the duty on raw material used in the paper trade was an insignificant item in the total cost of paper. It represented 7½d. or 10d. per 100 kilos. He complained that the paper trade was being deliberately sacrificed. The Customs Committee appointed to examine the question had never received or heard an official delegation from the French Paper-makers' Association. Yet a trade which employed 50,000 hands deserved some consideration, which had not been shown. A misunderstanding had occurred between the Press and the paper-makers. Some of these latter had been abruptly asked if they could deliver in twenty-four hours, in a week, certain (or rather uncertain) quantities of paper. Tied by long-standing contracts, time was necessary to permit the organization of an increased output, and their demand for this delay was impatiently brushed aside.

The Duke de la Tremoille, who had drawn up the Report of the Customs Committee, said that all that was possible had been done to arrive at an understanding. A whole month (April) had been given to the

makers. At the end of that time, nothing but vague declarations were forthcoming—no formal offer or categorical declaration that the French paper trade could meet the demand could be obtained. Meanwhile the situation was becoming intolerable. At the end of March, Parisian newspapers were informed that even their formal contracts could be no longer executed.

A statement that the total temporary abolition of the paper duty would throw thousands of men out of work would have been more impressive had not a critic pointed out that it was made at a now comparatively distant date.

The Minister of Commerce and Industry (M. Gaston Thompson) confirmed the assertions of the Duke de la Tremoille. He had received a letter from the Chairman of the French Paper-makers' Association, which stated that the mobilization of workmen, the difficulties of goods traffic, the invasion of certain parts of France, had seriously reduced the output of French paper mills; by about 40 per cent., he considered. "At this time," (said the Minister), "we still hoped some mills might be transformed and the production of newsprint thus increased. This hope was not realised, and a decree was accordingly issued reducing tariff rate. The 10 franc rate represented 35 per cent. of the value of the paper. At ordinary epochs, it effectually excluded the foreign-made article. He did not believe that the temporary abolition of the tariff would seriously affect the French mills. Foreign prices were at present as high as home quotations. . He excepted one country, but this country (which he did not name) was at present quite unable to immediately supply France with paper.

M. Crolard opposed the motion, taking the view that the 60 per cent. reduction in the duty already granted was sufficient. Before the war the normal figure was 7,000,000 copies per day, in round figures. Now, although some journals have disappeared, the daily issue had attained 15,000,000. This does not seem as if paper is lacking. (A member: But all the papers have cut their editions down. The increase is no argument as to the quantity of paper issued.) L'Echo de Paris, which had reached a circulation of 800,000, has fallen to half this. The French paper with the largest circulation is Le Petit Parisien, which issues 1,800,000 copies per day. (Le Petit Journal formerly claimed the largest circulation). L'Humanite, which had reached a circulation of 150,000 before the war, has fallen off by half. (A Member remarked that its readers were in the trenches.) The increase has come about through the immense demand for evening papers, and the weight can be estmated approximately by taking the average of four pages, varying from 27 to 30 grammes. The paper used by the Press might be estimated in this way at 450 tons per day. The reasons for the increase in price of paper have already been given. It is easy to calculate what will be the financial effect if the proposed suppression of duty is carried. As regards paper the State will lose nothing, because there was no importation of news' before the war. On the other hand, as regards pulp, there has been an enormous and progressive increase in the importation. The loss to the State would not go into the pockets of the public. He reckoned that some journals (alluding evidently to Le Petit Parisien) would economise £400 per day. The good pubilc always paid the same price for its newspaper, whether it was two, four or six pages. The making of news had become an "industry of transformation," instead of remaining "a complete industry," and this, said M. Crolard, was at the expense of the national wealth. He explained that by a complete industry he meant one that works up real raw material into a finished product. On the other hand, an industry of transformation takes a manufactured product for its raw material. He claimed that it was the case in the manufacture of news. The plant of some of the modern French news mills simply consisted of machinery capable of working pulp already prepared by the cellulose manufacturers. The paper-making industry is one of the most ancient in France. It occupies numerous families, with whom it has been a family trade for generations. Sixty years ago it worked altogether with native raw material. Some deputies had expressed their fear of using French wood, but he did not see any danger. Certainly at one time, in view of the remunerative and increasing demand of the paper trade, the French pine forests had been too thoroughly exploited, but now a days reasoned methods of cutting had been introduced, and the paper trade could use trees of small diameter and the waste of wood working. Some deputies owned pine forests, and he called them to witness that the paper trade did not merit the bad reputation that some seemed willing to give it. He called attention to the prosperity that the production of pulp had brought to Scandinavia, Tyrol, and the Black Forest. From all the pulp-exporting countries, Scandinavia, Canada, Germany and Austria, France takes yearly 30,000 tons of mechanical pulp and 85,000 tons of chemical pulp. The wood requires much labour to reduce it to pulp, and the wages are lost to France.

Paper-making, continued M. Crolard, was a valuable national asset. Indispensable alike to commerce and art, it employed large bodies of workpeople and considerable capital. Its contribution to goods traffic might be judged by the fact that for every ton of paper produced, three tons of material were conveyed to the mill,—coal, chemicals, pulp, etc., etc. The upkeep of the complicated machinery afforded employment to numerous other trades, felt, wire-work, rubber, resin, timber, each interesting some special district of France. Its present importance might be judged by the following statistics (1911):—

Seine et Oise.							
department	45	machines,	daily	output	379	tons.	
Isere	"	74	"	"	"	314	"
Pas de Calais	"	35	"	"	"	203	"
Vosges	"	38	"	"	"	161	"
Haute Vienne	"	33	"	"	"	158	"
Nord	"	16	"	"	"	125	"
Doubs	"	18	"	"	"	120	"
Charente	"	20	"	"	"	60	"
Haute Garonne	"	19	"	"	"	55	"

Other departments about 300 machines; in all 619, producing a total of 2,800 tons per diem.

The Duc de la Tremoille, the Reporter of the Committee, said that the Committee had been thoroughly convinced that the quantity of paper at the disposition of the Press was altogether insufficient. They recognised that the 60 per cent. reduction had not encouraged the importation of paper to the desired extent. The principal journals of Paris were deprived of at least 40 per cent. of the paper which was

necessary to them. He was speaking only of those that had contracts. One of the principal journals of Brittany had written to the effect that they had contracts for 175 tons of paper per month with one frim and could only get 20 tons delivered, and a contract for 50 tons with another firm, which delivered a still smaller proportion. He gave many other similar instances. This the reply to a letter written in April to a paper mill, who had advised its customer to apply abroad, offering to act as intermediary:—"We have asked Swiss paper-makers whether they can deliver. They tell us that it is not possible before the end of July. We think that if we hear immediately from you we can cover your requirements from Scandinavia." Four days afterwards another letter arrived to say that it was no longer possible to get deliveries of paper from Norway or Sweden. Under these conditions the Committee on Custom Duties had a right to say that it was no longer possible to secure the necessary paper for the newspapers of France. The price of paper imported into France, even without Custom Duties, is higher than the price of paper made in France. It can be said, without fear of denial, that there is no news obtainable from Switzerland, England, Holland, Sweden or Norway, before the end of August. It will be necessary to apply to the United States and Canada, where paper is dear, and the transport will further increase the price. The Reporter went on to point out that newspapers would receive the paper free of duty, but with all sorts of charges to pay; insurance, dock dues, etc., would amount to at least 70 centimes per cwt., and the waste would be greater. He wound up by calling attention to the use that the Germans were making of the Press, a propaganda of falsehood. The Committee asked the Chamber to vote for the proposition regarding the French Press as an arm, not offensive after the German practice, but strictly defensive, employed with the constant desire for the triumph of truth.

M. Lefebvre du Prey, in opposing, said that the Government had obligations not only to the Press, but to the whole country, and notably the manufacturers and the workpeople. The department he represented, Pas-de-Calais, produced paper very largely. It was in a painful position, part of its inhabitants were under the brutal hand of the Germans, and another part were in the war zone. Some of the most important mills had tried to re-open. Now he would read a letter addressed on May 9th of this year by the President of the Paper-makers' Association of the North of France to the Minister of Finance:—

Dear M. Ribot, -As President of the group of paper-makers in the north of France, allow me to call some facts to your attention.

We are advised that the journalists, not content with obtaining from the Government the decree of February 16th, disastrous for us, reducing by 60 per cent. the customs duties on news, have now commenced a fresh campaign for the complete suppression of all duties on foreign paper.

This measure would be the definite ruin of our industries.

The Press contends that the actual production of news is insufficient. This assertion is incorrect. The truth is on the other hand, that it is hard to place our production.

Dutch and Scandinavian newsprint and in neutral countries, German paper, tends every day to take the place of French news, which is unable to compete at the price.

Herewith are three letters bearing out this statement:—

1. A letter from M. Henry Verger, a Paris paper merchant, who sold on my account 100 tons of paper of my manufacture to Le Matin. In this letter, dated April 28th, Verger tells me that Le Matin has provided itself elsewhere, and that for the moment there is nothing to be done.

2. A letter from La Depeche de Rouen, telling me "Your paper is no use to us. We can buy imported paper at Rouein on more favourable conditions."

3. A letter from MM. Geissnar Levy & Co., of Paris, dated March 10th, declining an offer that I made to them, and stating that foreign paper was cheaper in spite of the four francs per cwt. customs duty.

We must be allowed to state that if the French Government recognizes that our industry requires protection in normal times, it seems incontestable that we require it still more during the war.

It will be extremely unjust to sacrifice us and to condemn our workpeople to idleness in order to allow the French journalists to buy their paper cheaper than before the declaration of the war.

CH. GUYOT.

M. Ringuier said he did not wish to throw any doubt on the sincerity of his colleague or of his Northern correspondent. But the Customs Committee had received affirmations of the nature of that cited. Promises of paper "when wanted" were easily obtained; but when asked for quantities and dates, manufacturers declined to engage themselves. He said this in no captious spirit, to decline to accept engagements one was not sure to be able to meet was frank and loyal. But they must face facts. He feared—he hoped he was mistaken—that there would be a shortage of paper in France, and perhaps in other countries. Wheat had gone up in price, in spite of Customs concessions. So would paper. The French makers would be thus covered and guaranteed.

A running fire of interruptions had shown that the sympathies of the Chamber were rather with the Press than with the paper-makers; and probably the final vote surprised no one present. By 393 ayes against 71 noes, a draft law was voted as follows: "From the date of promulgation of the present Act and until one month after cessation of hostilities, the rights of entry (Customs Duties) are suspended on: (1) Paper, other than fancy papers, machine-made, weighing over 2 ozs. per superficial metre and intended for use as newsprint; (2) Mechanical and chemical wood pulp for manufacture of above." A final clause provides that should the Government deem it desirable to re-establish the tariff before the date indicated, it should have the power to do so by a simple decree, issued by a Cabinet Council."

ADVERTISING FOREST PRODUCTS.

The Forestry Department of the British Columbia Government has lately been carrying on a publicity campaign on behalf of the lumber industry of that province. Bulletins containing interesting items regarding the condition of the trade are being sent out to the newspapers throughout the country while tastily gotten up booklets are also being distributed to the press and to business men throughout the Dominion. In brief it is an effort on the part of the B. C. Government to increase the demand for B. C. Lumber through the use of printers' ink.

(To be Concluded.)

Pigments Employed in Paper Manufacture

Notes on Chemistry of the Mineral Substances Used in the Tinting of Paper.

The number of pigments actually employed in the manufacture of paper and for producing the required tones of color, is very small. The most frequently used are the blues, such as smalts, ultramarine and prussian blue; and reds, such as rouge, venetian red, and sienna.

The following list shows the more important pigments, some of which, however, find very little application in the paper trade.

Barium Chrome (Yellow) $BaCrO_4$. Prepared by adding a solution of barium chloride to potassium bichromate.

Test. Heat with sulphuric acid. A white precipitate of barium sulphate is obtained and a green solution of chromium sulphate.

Bartyes. (White). $BaSO_4$. Barium sulphate. A natural pigment also prepared from soluble barium salts by precipitation with sulphuric acid.

Test. Boil inconcentrated sulphuric acid, in which barytes is soluble. Cool and pour carefully into water. The barium sulphate is precipitated.

Brunswick Blue. (Blue). A modified form of prussian blue. Prepared from ferrous sulphate, potassium ferrocyanide and barium sulphate.

Test. Apply a test similar to that for prussian blue. Barium sulphate can also be tested for.

Brunswick Green. (Green). A pigment prepared by mixing prussian blue, chrome yellow, and barytes (barium sulphate).

Chrome Yellow. (Yellow). Chromate of lead. $PbCrO_4$. Prepared by adding solution of lead acetate to a solution of bichromate of potash.

Test. Boil in a little strong hydrochloric acid, solution turns green. On cooling, white crystals of lead chloride are deposited.

Derby Red. (Chrome red). A basic lead chromate. $PbCrO_4.PbO$. Prepared from a mixture of white lead, potassium bichromate and caustic soda.

Test. As for chrome yellow.

Emeralda Green. (Schweinfurth green). A modification of Scheele's green, in composition being an acetoarsenite of copper.

Guignet's Green. (Chrome green). An oxide of chromium prepared by heating potassium bichromate with boric acid and previously ground into a paste with water.

King's Yellow. As^2_3. A sulphate of arsenic now practically obsolete, being a poisonous compound.

Ochres. (Yellow to orange). A natural pigment found in minerals, the chief constituent being hydrated oxide of iron compound with silicate of alumina.

Test. Similar to those used for iron pigments, red oxide, etc.

Prussian Blue. $K^2Fe_2(CN)_6$. Prepared by mixing solutions of ferrous sulphate and potassium ferrocyanide. Color not altered by dilute acides. Color discharged by alkali and restored by weak acids.

Red Lead. Pb_3O_4. Prepared by the careful oxidation of metallic lead.

Rouge. Red oxide. Fe_2O_3. A pigment occurring naturally in a variety of minerals. Such pigments as rouge, crocus, and red oxide are prepared from waste iron liquors and also from ferrous sulphate.

Test. Mostly soluble after prolonged digestion in strong hydrochloric acid, with the formation of a yellow or orange colored liquid.

Satin White. A mixture of calcium sulphate and hydrate of alumina. Prepared by mixing milk of lime in suitable proportions with a solution of sulphate of alumina.

Scheele's Green. A narsenite of copper. Prepared by mixing a solution of copper sulphate with white arsenic dissolved in soda.

Smalts. (Blue). A silicate of potassium and cobalt, Prepared from cobalt glass.

Turnbull's blue. $KFe^2(CN)_6$. Prepared by adding ferrous sulphate solution of potassium ferricyanide (see prussian blue.)

Ultramarine. (Blue). An artificial pigment, the chief constituents of which are silicates of alumina and soda. Prepared by heating together a mixture of china clay, carbonate of soda, sulphate of soda, sulphate and charcoal.

Test. Decolorized by weak acids with the production of sulphuretted hydrogen. Color unaltered by alkalies. Color rendered more violet when the ultramarine is heated with alum solution.

Umber. (Yellow to violet brown). A natural brown pigment similar in composition to ochres, but containing more manganese.

Vermilion. (Red). HgS. Occurs naturally as the mineral cinnabar. Also prepared by heating mercury and sulphur together.—Sindall and Bacon in "Paper Makers Monthly Journal.

SPANISH RIVER PULP AND PAPER

The annual meeting of the Spanish River Pulp and Paper Company, Limited, is announced to take place on September 30th.

Net profits fo rthe year ended 30th June last—were $1,019,577, which is $140,292 more than last year.

The following statement of the Company's affairs has been presented by Mr. W. E. Stavert, president of the Company.

	Spanish Co.	Lake Superior Co.	Total.
Net revenue	$478,644	$540,933	$1,019,577
Balance brought forward	125,693	36,347	162,040
	$604,337	$577,280	$1,181,617
Sundry adjustments	50,808	x89,327	x38,519
	$655,145	$487,953	$1,143,098
Less — Interest on funded debt, etc.	369,479	401,160	770,639
	$285,666	$86,793	$372,459
Less— Depreciation	63,156	40,973	104,129
Net surplus	$222,510	$45,820	$268,330

x Deduction.

The Brompton Pulp and Paper Co. of East Angus, Que., have opened an office in Toronto, 505 C. P. R. building. R. H. Bryan has been appointed representative of the firm.

Newspaper Men Discuss Many Topics of Interest

(Special to the Pulp and Paper Magazine.)

From all over Canada newspaper men gathered in Toronto on Septembr 2 and 3 to attnd the fifty-seventh annual meeting of the Canada Press Association. The proceedings were marked by earnestness and enthusiasm and the discussions were harty and profitable. Then, after two days' work, the members attended the Canadian National Exhibition, Toronto, on "Press Day," where they thoroughly enjoyed themselves.

Though the war has seriously affected the revenue of all newspapers, there was a spirit of optimism and cheerfulness throughout the convention, and the future was viewed with assurance and confidence. Among the distinguished visitors were William A. Thompson, of New York, Director of the Bureau of Advertising, American Newspaper Publishers' Association, and Dr. Talcott Williams, Director of the School of Journalism, Columbia University, New York. The former delivered an able and inspiring address on "How Publishers Can Co-operate in Developing Advertising." He said that some newspapers were so busy in strangling one another that they apparently had on time to get the thousands of dollars that would result from development work. What was needed was a standardization of business policies and greater co-operation among publishers in developing advertising. He warned the newspaper proprietors against the evil of free publicity.

There was some discussion on the "'Made-in-Canada" advertising campaign, and it developed that no country weeklies had received any benefit. The matter was referred to the Committe on advertising. It was pointed out by some members that, while the Canadian Manufacturers' Association has spent twenty-five thousand dollars in advertising the "Made-in-Canada" campaign, the newspapers had donated, at least, one hundred thousand dollars worth of publicity, for which not a cent was paid.

Mr. Thompson also spoke on "Selling the Daily Newspaper to Advertisers." He deprecated the method of pointing out how much more advertising one newspaper carried than another. Circulation pleas had also been worn threadbare. Manufacturers were interested in getting the support of the dealer, and the newspapers were, he contended,the best medium through which that support could be obtained.

Dr. Talcott Williams, spoke on the "Desirability of Establishing a School of Journalism in Connection with one or more of the Canadian Universities." He pointed out the many qualifications that a newspaper man must have, and the value of a training in such a school. The school must prepare while the newspaper must inspire. A School of Journalism could no more make a journalist than a medical college could a doctor, or a law school a lawyer, but it could equip for technical tasks. The discussion, which followed, was led by Dr. Falconer, of Toronto University, who generally endorsed the remarks and observations of Dr. Williams, and said that one thing brought forcibly home by the war, was the power of the daily and weekly newspaper. Many university graduates had gone into newspaper work, and there must be trained leaders for democracy, intellectually clear, morally stable, and with common sense from mingling with people. If the press believed there should be such a school, he was confident there would be one, but the question arose, had we come to that time when journalists should have the same privileges and honors as other learned professors, and had we in Canada reached the position of recognizing another learned profession where men were going to be set aside with a stamp on them giving status to differeniate them from others.

A number of leading Canadian publishers and editors talked on the question, most of them favoring such a school as a valuable auxiliary and factor in connection with newspaper work. A committee was appointed, of which Sir John Willison, Toronto, is Chairman, to investigate the matter and submit a report at the next annual meeting. Among the representatives of the Trade and Class Press Section appointed on the committee, were J. J. Harpell, of the Industrial and Educational Press, Montreal, and D. B. Gillies, of the MacLean Publishing Company, Toronto.

There was also a discussion on the advisability of increasing the price of newspapers to subscribers. It was pointed out that the war had resulted greatly in cost of producing both daily and weekly newspapers, and E. K. Whiting, manager of the Journal-Chronicle, Owatonna, Minn., said the weekly newspapers there had successfully raised their subscription price to one dollar and fifty cents a year. No definite action was, however, taken.

Joseph T. Clarke, of the Toronto Star, spoke on the "Value of the Editorial Page," and said it was generally found that the best newspapers were those with the best editorials, as these papers possessed personality and gave the reader an impression. It was agreed by several speakers that the people would read editorials if they were worth reading, had the necessary "punch" and used self-respecting language.

"The Party and the Paper" was also discussed by M. W. Rossie, of the Port Arthur Chronicle, who said that ninety-nine out of every hundred papers in Canada were party papers, but the party paper should not be regarded as a henchman by the politicians. It should have a mind of its own, and could be vigorous without resorting to vituperation. No paper had anything to fear by taking this course. A paper could control its own policies if it wanted to, and the business of a newspaper was to lead.

George A. Kingston, of the Ontario Workmen's Compensation Board, Toronto, told the newspaper publishers that the act was of great benefit to the employee, and he was sure that employers would find that it would be a boon to them as well. It did away with the possibility of law suits and would save employers money.

Many other topics were also considered at the convention. V. E. Morrell, of Sherbrooke Record, was elected Chairman of the Daily Section, and E. Roy Sayles of Port Elgin Times, Chairman of the Weekly Section, and Acton Burrows, Chairman of the Trade and Class Press Section.

The new President of the Canadian Press Association is W. E. Smallfield, of the Renfrew Mercury, while the Vice-Presidents are as follows Ontario and Quebec Division, J. G. Elliott, Kingston Whig; Maritime Provinces Division, D. F. McLean, Port Hood Greetings; Manitoba-Saskatchewan Division, E. H. Macklem, Winnipeg Free Press; Alberta and Eastern British Columbia Division, J. H. Woods, Calgary Herald; Western British Columbia Division, John Nelson, Vancouver World.

NEW PATENTS

A NEW WOOD BARKER.

A patent has been issued in the United States to Adolf A. Alfsen, of Honefos, Norway, assignor to J. & A. Jensen & Dahl, of Christiania, Norway, on an invention for the barking of wood, which is described in "Paper" as follows:—

This invention relates especially to apparatus for the barking of wood in connection with the manufacture of paper therefrom.

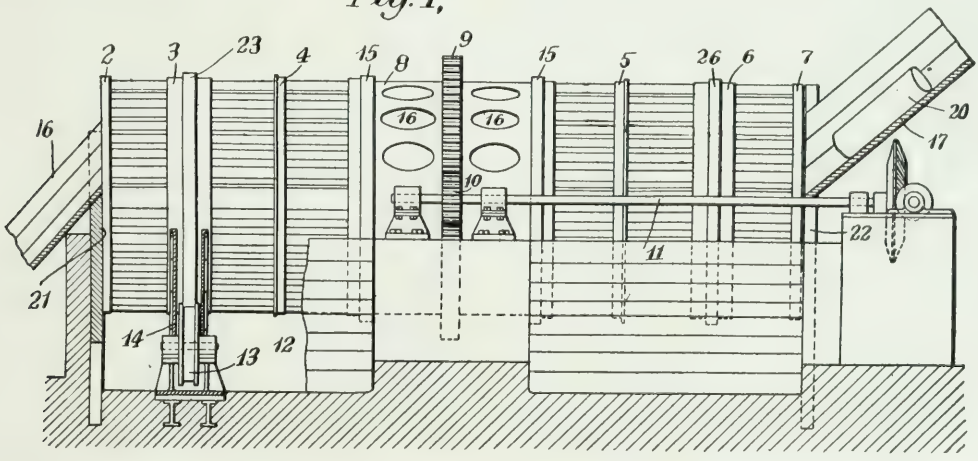
The logs of wood from the cutting-off saws are fed into one end of an open-ended internally ribbed barking drum provided with slots in its periphery and arranged to be rotated while its lower portion is immersed in a water tank. The charge of logs within the drum is thus agitated and tumbled by being periodically lifted to a considerable height in the drum and then dropped upon the other logs and the internal ribs or projections of the drum, this action and the incidental rubbing of the logs loosening and separating the bark which passes through the slots in the drum and is thereby torn from the logs and washed into the outer tank by the agitation of the water in which the drum is partly immersed. The logs are continuously fed into one end of the drum preferably adjacent the descending side thereof in such manner as to keep up a heap of logs at this end of the drum, thereby producing a pressure of the material toward the opposite end of the drum. In this manner the gradual feeding of the logs lognitudinally through the drum is effected while their substantial alinement approximately parallel to the drum axis is maintained and this effects their automatic discharge from the opposite end of the drum.

In the accompanying drawings showing in a somewhat diagrammatic way illustrative embodiments of apparatus for carrying out this invention, Figure 1 is a side view partly in section. Figure 2 is a corresponding end view in which parts are shown in section for greater clearness; and Figure 3 is a partial top view of the apparatus.

A suitable form of barking drum for carrying out this process is illustrated in the drawings as constructed of angle irons 1 which may extend the full length of the drum and be riveted or secured to a number of iron rings 2 to 7 and also if desired to a central reinforcing cylinder 8 of sheet metal to which the crown gear 9 may be secured through which the drum is rotated by the drive pinion 10 on the shaft 11. By means of this arrangement the drum may be rotated at the desired speed and it is advantageous to keep the drum in continual rotation for many hours or days at a time. The angle irons are preferably spaced apart at suitable distances from one another so as to form slots in the periphery of the drum through which water and bark may pass under operating conditions. It is also desirable to have one or more flanges of these angle irons project inwardly in a substantially radial direction as indicated so as to form internal ribs or projections to promote the barking action. The dimensions of the angle irons and the distance between them and the radially arranged ribs formed thereby are so proportioned in relation to the logs to be barked that the logs are carried up a considerable distance by the revolving drum before tumbling or falling down to the lower part of the drum over the charge of logs and thus forcibly striking the ribs or projections and the other logs to promote the barking action.

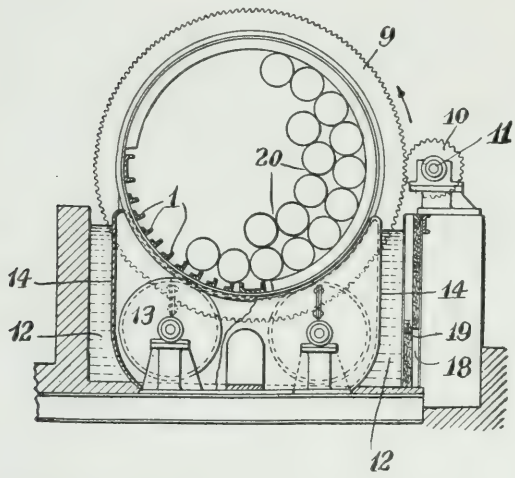
The drum may be provided with a number of tires such as 23, 26, spaced apart at suitable distances along the drum and cooperating with large bearing rolls, such as 13, which are preferably flanged and mounted within suitable roll casings, such as 14, which shroud them and prevent undesirable access of bark and other material in connection with the rings 3, 6 which are made broad enough to substantially close the inner faces of these casings. These rolls may with advan-

Fig. 1.



tage be given a diameter of about a third to a half of that of the cooperating tires which considerably promotes their wearing qualities and continued efficiency under this service. As indicated, the lower part of the drum may be arranged within a suitable tank, such as 12, filled with water to the desired height so as to submerge the lower third or so of the height of the

Fig. 2.



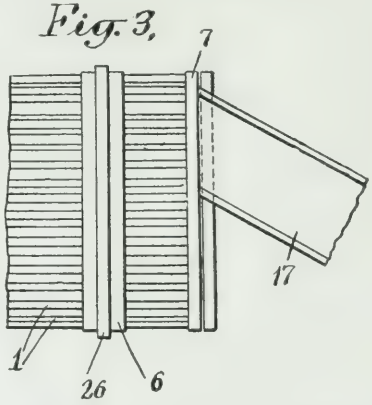
drum which may be operated in a substantially horizontal position, although in some cases increased efficiency and reliability in the feed of the logs therethrough can be secured by a slight inclination toward the discharge end which may also be promoted by giving the drum a slightly increased diameter at that end where the drum axis is substantially horizontal.

As indicated in the drawings two supporting tires 23, 26 are arranged adjacent each end of the drum and it is also desirable in most cases to use the additional intermediate tires in connection with cooperating bearing rolls and casings in the tank which are not shown for greater clearness. The reinforcing cylinder 8 may with advantage be formed with one or more series of large openings, such as 16, so as to give the desired freedom of access to the slots in this part of the drum and allow the washing of bark therethrough into the tank. The bark may be allowed to collect in the tank for several days or more at a time and then be removed therefrom by draining the tank as by raising the gate 19 in the side 18 of this tank so as to withdraw the water and suspended bark in this way, additional water being used if desired to wash out any remaining portions of bark. An inclined discharge chute 16 may be arranged to cooperate with the open discharge end of the barking drum and may be arranged in connection with the rising side of the drum as indicated in Figure 3, the remainder of the drum end being preferably closed, as for instance, by a stationary casing or partition, such as 21. A similar casing or partition 22 may be arranged adjacent the inlet end of the drum, there being arranged in connection therewith any suitable means to feed into the drum the sections of logs which are preferably elongated so as to have a length at least several times as great as their diameter which assists in maintaining their alinement within the drum and preventing their ends coming into undesired contact with the drum ribs which might cause objectionable splintering of the wood. This chute 17 which is preferably arranged on the descending side of the drum may be vertically inclined and may also be preferably inclined in a horizontal direction as shown in Figure 3, so as to direct the logs 20 toward the inner walls of the drum on its descending side where there is normally a free space under operating conditions so that the entering logs can assume a position substantially parallel to the drum axis and sides.

Under the manufacturing conditions in Norway where the logs have a diameter up to about a foot, they are given a uniform length of apout two and a half to three feet and the barking drums may be given an internal diameter of about six or seven feet or so. Under American conditions where the wood runs considerably larger, up to a diameter of something like two feet, it is desirable to have the logs correspondingly longer and the drums may with advantage be given a diameter of ten or twelve feet or more and their length may be made as great as desired in connection with convenience of construction and operation. It is also desirable to avoid excessive differences in size of the logs which are fed into the drum at any one time, since otherwise there is a tendency for the smaller logs to be fed through the drum and discharge more rapidly than those of large diameter and weight.

Under normal operating conditions the charge of logs may fill the interior of the drum up to about half its capacity as roughly indicated in Figure 2 and be continually agitated and tumbled by the rotation of the drum which carries upward the logs in contact with the ribbed walls of the drum and then drops them over the other logs of the charge into contact therewith and with the barking ribs or projections on the drum itself.

Fig. 3.



This loosens and breaks off the bark adhering to the logs and the energetic washing action of the water in the bottom of the drum washes the ends of the bark through the slots in the periphery of the drum so that it becomes more or less entangled and held there in connection with the logs which roll over it so that the bark is torn and knocked off the logs and finally washed out through the drum slots and remains suspended in the water in the tank outside. This action takes place, furthermore, without material loss or injury of the wood itself such as is incident to the usual barking processes and the process may be substantially automatic and effected with a relatively slight expenditure of power.

If desired the logs may be fed into the drum in a substantially continuous manner by feeding them in preferably toward the wall of the drum on its descending side so that these entering logs are brought into proper alinement with the other logs of the charge and maintained in position substantially parallel to the drum axis during this tumbling process. The incoming logs form a heap at this end of the drum and this heap exerts a pressure in axial direction on the other logs, whereby is caused a gradual feeding of the logs longitudinally through the barking drum so that they are automatically discharged in a substantially continuous manner from the opposite end of the drum.

LARENTIDE ANNUAL

The Annual Meeting of the Laurentide Company Limited, was held a few days ago in Montreal with Mr. George Chahoon, Jr. in the Chair, in place of the late Sir William Van Horne, President. More than ordinary interest was attached to the meeting owing to the fact that during the past year or two Laurentide was engaged in extensive power developments and the shareholders were anxious to know just how these plans would affect the welfare of the company. In addition the abnormal conditions presented by the war were bound to affect the company's position.

A very satisfactory report was presented by Mr. Chahoon; Dealing with the water power development he said:

"There seems to be a great demand for power from a number of sources, and we are now more enthusiastic regarding the sale of our surplus power than when we asked the shareholders to make the development."

He further stated that the company expected to be delivering power by the first of November when one unit would be put into operation. Two more units would be started on the 15th of the month and six by the first of January. The expected horse-power to be developed was approximately 125,000 and the cost would amount to about $5,500,000, the sum estimated at the outset. Of the total horse-power at least 100,000 would be disposed of to outside concerns.

Regarding the states of the paper business, Mr. Chahoon said that this was well known in the annual statement. He said they had a very successful drive, and that they had got down the biggest lot of logs in the history of the company. Between 60 and 75 per cent of the wood for 1915 and 1917 has been contracted for from competitors of the company.

The shareholders present expressed their gratitude at the splendid showing made by the company, and a resolution was passed expressing the sympathy of the board at the illness of the president, Sir William Van Horne.

The financial statement presented was received without further comment. It showed profits for the year amounting to $807,191, as compared with $730,774 last year, while the surplus for 1914 was $211,191, against $134,774 last year, an increase of $76,417.

There has been a good deal of interest in the financing of the new power plant in connection with which a $4,000,000 bond issue was authorized. On this point the report says:

"The bond issue of $4,000,000 referred to in the last annual report has been created, but, in view of a possible re-arrangement of this financial feature, your board deemed it wise for the present to withhold the bonds from sale, a portion of them, however, being in the meantime used as a collateral for advances by the bank."

A comparative statement of the profit and loss and working account for the years 1914 and 1915 is as follows:

Working Account.

	1915.	1914.
Mill nets from ground wood, sulphilte pulp, paper and cardboard	$943,272	$829,903
	$1,034,606	$944,958
Deduct—		
Bond interest, and other charges	$165,614	$156,818
Betterments to plant	61,799	57,366
	$227,414	$214,184
Profits for the year	807,191	730,774

Profit and Loss Account.

	1915.	1914.
Profits for the year	$807,191	$730,774
Dividends on capital stock	768,000	576,000
Depreciation reserve	20,000	20,000
	$788,000	$596,000
Interest charged to power development during construction.	192,000	.....
	$596,000	
Surplus for the year	$211,191	$134,774

Assets

	1915.	1914.
Mills, buildings, plant and machinery	$5,203,901	$5,033,914
Timber lands	2,152,057	2,152,057
Real estate workmen's houses, etc.	495,030	437,307
Railway siding and rolling stock	50,000	50,000
Power development	3,553,582	2,117,028
Logs and supplies	988,997	766,903
Merchandise	349,146	344,342
Mill supplies	271,986	294,383
Insurance and taxes	17,587	8,493
Forestry	71,979	46,353
Accounts receivable	907,690	640,667
Bills receivable	4,899	.....
Cash in hand and in banks	44,351	18,896
Investments	106,331	153,631
Deferred charges	14,691	11,093
	$14,232,235	$12,075,073

Liabilities.

	1915.	1914.
Capital stock	$9,600,000	$9,600,000
Bonds	753,806	798,191
Bond interest due July 2	36,000	36,000
Com. stock div. and int. (due July 2)	192,000	175,566
Wages	54,327	14,652
Bank loans	2,037,437	304,265
Accounts payable	370,468	268,983
Bills payable	6,964	.....
Sundry reserves	29,592	79,453
Depreciation reserve account	310,000	290,000
Contingent account	25,534	16,528
Surplus	701,624	490,432
	$14,232,235	$12,075,073

UNITED STATES NOTES

The plant of the Russell Falls Company, at Russell, Mass., shut down last week. No reason was given, but it was indicated that the operations would begin again in about a week. The fires are being kept up and the usual watchmen are on hand.

The reconstruction of the paper mills of the Hawel Pulp and Paper Company of Oregon City, Ore., is nearing completion. Several machines will be installed in the new Fourth Street warehouse to make tissue paper. The entire cost of the reconstruction will be about $30,000, including the new machines in the warehouse. The repairs began shortly after the mill closed late in the spring, on account of the low water. The mill will be closed until late in the fall, when it will start full blast.

The Perkins-Goodwin Company, 33 West Forty-Second street New-York will hereafter have the agency for the Bathurst Lumber Company, Ltd. of Bathurst, N. B. This Company, will have a daily output of fifty-tons. It will start its mills operating on unbleached sulphite within the next month. By December it is planned to manufacture only bleached sulphite. In view of the continually growing uncertainties for future supplies of bleached pulp, it is believed this stock will be welcomed in the market.

W. H. Donaldson, who has been assistant manager of the pulp department of the Parsons Trading Company is now with the sales force of Mr. Gottesman and Son, 18 East Forty-First Street, New York. Mr. Donaldson has many friends in the trade and is well qualified by his long experience to make a success of his new position. He was with the Union Bag and Paper Company for over fifteen years.

W. B. Hayes, treasurer of the Badger Tissue Mills of Kaukauna, Wis. has recently been appointed one of the United States marshals, with an office at Milwaukee, Wis. Mr. Hayes was one of the organizers of the Badger Tissue Mills. He will continue to act as a treasurer of the Badger Tissue Mills, as it in no way conflicts with the duties of his office.

Work will shortly start on seven new buildings adjoining the present plant of the District of Columbia Paper Mfg. Company, Georgetown, D. C. The proposed adition will cost about $400,000. Several new machines will be installed in the new buildings. The plans were drawn at the office of the company and sub-contracts are being left for the erection of the buildings. It is stated at the office of the company that work is going on day and night in the present plant of the mills and the addition was made necessary because of the lack of room in the present plant.

Plans for the construction of a new sulphite mill, of the Island Empire Paper Company at Midwood, Wash. have been completed and work will be begun in the near future. Further details of the plans for the new improvements were talked over and practically decided upon at the annual meeting of the stockholders of the company held at Spokane last week, at which directors and officers were elected. Judson G. Rosebush, of Appleton, Wis., was re-elected president, R. S. Talbot vice-president and general manager; W. A. Brazeau, secretary, and L. M. Alexander, of Port Edwards, Wis., treasurer.

E. P. Andrews Paper Company of Washington, D. C. have just been awarded the contract for furnishing 90,000,000 manila facing slips by the Purchasing Agent of the Post Office Department. Bids were opened for these slips three carloads on August 20, and the Andrews price was at $35,935 per 1,000,000.

The Allen mill of the Union Bag and Paper Company at Hudson Falls, N. Y. has started operation after a brief shutdown. A new cylinder machine has been installed for the making of Kraft wrappers and sack papers.

The Howard Paper Company of Urbana, Ohio, declared its usual annual dividend on September 1. This indicates that the depression which exists in some sections of the country has not reached Urbana. Maxwell Howard, is the president of the Howard company of Urbana.

The Remington Paper and Power Company at Watertown, N. Y. received notice last week that Federal Judge George W. Ray, of the United States District Court, has rendered a favorable decision in the famous Eibel Process case, brought by the Eibel Process Company against the Remington-Martin Paper Company. The court holds that the defendent paper Company did not infringe on the Eibel patent, and states at the conclusion of his opinion that there will be a decree dismissing the bill for want of equity with costs. The Eibel patent was issued on February 26, 1907 and relates to that section of a Fourdrinier paper machine between the breast roll and the couch roll, known as the wet end of the machine. The object of the patent was to construct and arrange this end of the machine so that it would run at much higher rate of speed and yet at the same time produce a strong sheet paper.

The Lockport Paper Company of Lockport, Niagara Falls, N. Y. has filed a protest with the assessors of the city of Lockport against the assessed valuation of the company's property for the year 1915. The assessed valuation on the company's property in the Lock City is placed at $113,000. The company seeks to have its assessment reduced to $60,000.

American Technical Section

Keen interest attaches the announcement of the technical Section of the American Pulp and Paper Association that a meeting of the section will be held at the time of the National Exposition of Chemical Industries in the Grand Central Palace in New York on September 23rd. The American Section has been progressing most favorably and the first regular meeting promises to afford a great interest to all who attend.

While the programme for the meeting of the Technical section has not yet assumed definite form, the Committee on Publication announces that several papers have been promised, and addresses will be made by well known representatives of the pulp and paper industry in addition to the usual committee reports and statements by officers of the section.

Among the papers promised by members, some of which will be illustrated by lantern slides, are the following:

"Some Experiences in Refining Groundwood Slivers", by D. L. Bellinger.

"A Method of Determining the Current Capacity of a Cell in an Electrolytic Bleach Plant," by F. G. Wheeler.

"The Relation of Ink and Paper in Halftone Printing", by H. P. Carruth.

"The Possibilities of Accurate Determinations of Groundwood in papers", by Max Cline.

"Work of the German Association of Cellulose and Paper Chemists", by Henry F. Obermanns.

"Suggestions for the Adoption of Standard Tests and Process", by Dr. Otto Kress.

The welcoming address will be made by Frank L. Moore, of Watertown, N. Y., president of the American Paper and Pulp Association.

In addition to the foregoing programme of papers, which is a tentative one sure to be considerably expanded between now and the date of meeting, arrangements have been made by the exposition authorities for addresses on subjects of national importance. The following list of speakers is now almost complete and contains the names of many well known speecialists who are in a position to give first-hand information that will be undoubtedly of great value to professional workers as well as to the interested public.

L. H. Baekeland—"Development of the Chemical Industry."

John Barrett, Director Pan-American Union—"South American Opportunities".

W. D. Coolidge, General Electric Company—" The X-Ray."

Linn Bradley, The Research Corporation—"Solution of Smoke, Dust and Fume Nuisances by Electrical Precipitation.

F. W. Keough, President National Association of Manufacturers—"Accident Prevention in the Chemical Industries."

Geo. Frank Lord, duPont de Nemours Powder Company—"Farming with Dynamite."

Thos. H. Norton, Department of Commerce "Foreign Markets for American Chemicals."

D. G. Pierce, Barber Asphalt Company—"Work with the Uultra Microscope".

Welding Ring, President American Exporters' Association—"Transportation and Shipping Facilities with Foreign Countries."

S. P. Sadtler, S. P. Sadtler & Sons—"American Contributions to Industrial Chemistry."

I. F. Stone, President National Aniline & Chemical Company—"The Aniline Dye Situation."

J. L. Taylor, U. S. Bureau of Mines—"Explosives."

Harrington Emerson, The Emerson Company "Efficiency in Chemical Industries."

Percy Wilson, Secretary Association of American Portland Cement Manufacturers—"The History of Cement."

Howard H. Gross, President of Tariff Commissio League "Tariff Discussion."

OTTAWA NOTES.

Ottawa, Ont., September 11—The late W. H. Rowley, president and joint manager of the E. B. Eddy Company of Hull, left an estate of almost a million. His will was probated last week and indicated a total bequest of $697,583 of which $224,800 consists of the interest held by the deceased in the E. B. Eddy Company itself. The remainder was in real estate and in stocks in Canada and the United States. Mrs. Rowley and her two young children inherit the bulk of the estate while nieces and other relatives were also remembered and there were a number of bequests to charity.

The anouncement from New York of the discovery by United States Government experts of a process for the manufacture of dyestuff materials from crude products has been greeted with great interest in paper trade circles here. The E. B. Eddy Company of Hull has had its chemists at work ever since the war began experimenting along these lines but so far they had been unsuccessful. The shortage of dyestuffs hitherto obtained from Germany, has become so pronounced that the Eddy Company, like many other Canadian firms, has been encouraging the use of white instead of colored paper products. Consequently such a discovery as is claimed is a matter of vital interest to them and it is being closely followed with the hope that it will shortly be on the market.

Considerable interest has been created in local political circles and, indirectly, among the paper trade, in the announcement that an investigation will likely be conducted into the construction of the St. Maurice River Dam. As the dam is designed to be a great facility for the production of power for pulp and paper companies operating on this stream the news is naturally of interest in trade circles. As heard here the allegations are that after one contract had been awarded for a portion of the work on the big structure, it was rescinded, a second being let at a price some $80,000 higher, and that a royal commission of inquiry is to be held.

Owners of lumber and paper mills in Hull are now breathing easier as a result of the apprehension and conviction of the incendiaries responsible for the series of fires during the past year in which thousands of dollars of timber and pulpwood went up in smoke. Emil Dupuis and Emil Boulay of Hull have been sentenced to 12 and 14 years respectively for arson. It was proved that they were responsible for a fire in the yards of the Gilmour and Hughson Company of Hull, which caused $180,000 damage and there is no doubt that they also started the others in the long series of lumber pile fires among Hull industries. For the last six months timber and paper mill owners in Hull have been maintaining double staffs of watchmen because of these occurrences.

PULP AND PAPER NEWS

At the recent Canadian National Exhibition, Toronto, there were a number of interesting and attractive displays in the paper line. The Interlake Tissue Mills, of Merritton, had a splendid exhibit of toilet and tissue papers, light wrappings, and decorated crepe tissues of many delicate tints, as well as paper napkins, table cloths, towels, camping outfits, etc. The booth was in charge of George Carruthers, manager of the company. W. J. Gage and Co., Toronto, and the Kinleith Paper Mills, St. Catharines, made a fine showing of Holland linen and other lines of writing papers. The Martin Corrugated Paper and Box Co., Limited, Toronto, exhibited Martin wall board, which is made of pure wood fibre, the fibre being bonded together under pressure. Samples of the board were given away. It is adapted to replace lath and plaster for walls and ceilings. The board is finished smooth on one side and burlap finish on the other.

Alex. Buntin, of the Buntin, Reid Co., Toronto, who has been spending a few weeks' holidays at Kamouraska, Que., has returned to Toronto. G. A. Howell, of the Howell Trading Co., who has been enjoying a rest in Haliburton country, A. A. Huestis, who has been at Scarboro, Maine, and Thomas Gain, sales manager for the Don Valley Paper Co., who has been recuperating in the Adirondack Mountains, are among the paper representatives, who are once more back in Toronto.

William Robinson, late with Price Bros. and Co., has joined the staff of the Laurentide Co., with which company he was for several years as their representative in Great Britain.

James T. Mix, who for the last three years has been sales manager for the Lake Superior division of the Spanish River Pulp and Paper Mills, with headquarters at Dayton, Ohio, has been appointed sales manager of the newsprint department of Price Bros. and Co., Kenogami mills, and will handle the output. He has opened offices in New York city. Mr. Mix has had an extended insight into the business, being with the Great Northern Paper Co. and the International Paper Co., and other concerns.

The Coating Paper industry in Canada is to be congratulated upon securing the services of the distinguished Scotch Superintendent, Mr. R. B. Foulis, of Rutherglen, Scotland. Mr. Foulis entered the Inverosk Mill at the age of sixteen, and spent ten years in this mill working on the different processes of coating. He then took an executive position with the Clyde Mills, and during the next ten years succeeded in increasing that plant from six single machines to ten single and two double machines, and made for the Clyde Coated a world-wide reputation, as their Enamelled Surface papers are the last word in Coated Paper in Great Britain and the Colonies. Mr. Foulis resigned his position with the Clyde people to accept the Superintendency of the Barber Mill at Georgetown, for the Provincial Paper Mills Company. Mr. Foulis is accompanied by Mr. Dickie, a prominent Scotch color man, who will be his assistant at the Barber Mill.

The Canadian Cheese Box Co., Limited, of Ottawa has been granted a federal charter with a capital stock of $90,000. The company is empowered to manufacture cheese boxes, barrels and butter boxes, as well as pulp, paper, cardboard and other paper products. The incorporators are Byron Moses, Robert K. Milks, Wm. E. Scrivens and John T. Lawson, of Ottawa.

The Canada Blue Print Co., Limited, has been granted a provincial charter. The headquarters are in Toronto, and the capital stock is $10,000. The company is authorizezd to carry on the business of the manufacture of blue prints of every nature, and to engage in the trade of stationers, printers, lithographers, etc. Among the incorporators are John S. Galbraith, E. V. Donaldson, Thomas I. Anderson, J. W. Anderson and F. H. Macdonald.

The Magic Wall Paper Remover Co., with a capital stock of $40,000, and head offices in Toronto, is a new concern which has just obtained a federal charter. The company made an interesting exhibit at the Canadian National Exhibition, Toronto.

The Trent River Paper Co., Limited, whose plant is at Frankford, Ont., have been making extensive improvements to their dam and overhauling their equipment. The company will soon put on the market some specialties in the line of boards.

John Bower, who was formerly with the New Brunswick Pulp and Paper Co., Millerton, N.B., has been appointed Maritime Provinces representative of the Victoria Paper and Twine Co., Toronto, and has entered upon his new duties.

Mr. Wilment, assistant accountant of the Canada Paper Co., Windsor Mills, Que., has enlisted for foreign service.

At a recent meeting of the Ontario Paper Makers' Protective Association, a committee composed of W. P. Gundy and I. H. Weldon, Toronto, and C. H. L. Jones, of Sault Ste. Marie, was appointed to secure the services of a Safety Engineer for the Association, to look into the matter of all mills taking proper measures and using safety appliances in order to guard against accidents. It is hoped in the near future to have every pulp and paper mill in Ontario enrolled in the membership of the Association.

Sir Mackenzie Bowell, of the Intelligencer, Belleville, who has been identified with that office for over eighty years, and is now in his ninety-second year, has returned from a trip across the Continent.

H. R. MacMillan, who is making a world tour in the interest of Canadian timber, under the Department of Trade and Commerce, Ottawa, sends a report from London, Eng., that Canadian timber is much appreciated in the United Kingdom.

L. W. Manchee, who founded the Ideal Bedding Co., Toronto, and disposed of his interest a few years ago, Toronto, buying out A. E. Rudd, who established the is now President of the Rudd Paper Box Co., Limited, plant eight years ago. Mr. Rudd and wife will spend the winter in California, and enjoy a well- earned rest.

The Markets

CANADIAN MARKETS

The market for print news keeps up very well and the outlook for fall business, particularly in the west, is re-assuring. Many inquiries still reach the exporting mills from foreign countries asking for prices and deliveries but nearly all the large plants have practically all the business that they can attend to and there is difficulty in securing shipping facilities. The price for news print remains steady. The arrangement for marketing the output across the border which was referred to some time ago, has practically been effected. The plants have been divided into two groups, the eastern and the western. In the latter are the mills of the Spanish River Pulp and Paper Co. and the Abitibi Power and Paper Co., the sales offices of which will be in Dayton, Ohio, under George H. Mead and John G. Sutherland. The eastern group consists of Laurentide Co., Canada Paper Co., J. R. Booth and the Brompton Pulp and Paper Co. The daily capacity of all these plants is between ten hundred and eleven hundred tons, and it is expected that marketing expenses will be reduced and news print prices maintained on a better level than heretofore. H. G. Craig and Co., of New York city, will be selling representatives of the eastern group.

There is some fear that before the end of the year, ultra marine blue and other colors will give out. The color situation is daily becoming more acute and all plants prefer to cut out as much of this business as possible.

In the book, bond, writing and ledger paper lines, now that holidays are over, there has been quite a noticeable improvement in orders and business has picked up with a number of printers owing to the abundant harvest in the west several large firms, which have been holding back the publication of catalogues, are getting out such printed matter and the outlook is good.

It is interesting to note in connection with the dearth of dye supplies, that with several metropolitan dailies across the line, the color has changed and news print bears a yellowish tint. It is said that the yellowish appearance will become more pronounced as the supply of blue dyes grow less available, and Canadian dailies may soon appear in a sort of yellow. To use sufficient blue dye to keep the product white would increase the price of news print by, at least, a dollar and a half a ton. It is probable that some publishers, owing to the growing cost of getting out newspaper since the war, may raise the susbcription fee.

This matter was freely discussed at the recent meeting of the Canadian press Association held in Toronto. No decisive action was, however, taken.

In the sulphite pulp line, while there are numerous inquiries, sales are not large. It is said, that it is impossible to arrange contracts with many mills in Norway and Sweden, as they are sold up for the remainder of the year. Supplies on the docks have decreased to very low levels and, meanwhile, buyers are marking time. The tendency of prices is to increase and quotations are stiffer than they have been. Little change is exhibited in the ground wood situation. Water conditions are keeping up well and, on account of being able to grind their own pulp, many paper mills across the border, have not felt the need of entering Canada for supplies, prices are holding up.

In the rag and paper stock arena there is a consistent demand for good, clean mixed papers and news, with little better values in each. There has been another increase in roofing stock and on a few other lines, several of which have begun to move much better than they have for several months past.

With the advent of September, it is expected trade will pick up materially. That the past twelve months have been better in the paper world than was generally supposed, is revealed in the showing made in the annual reports of the Laurentide Co., which had the best year in its history, and in the operations of the Spanish River Pulp and Paper mills which showed a very material gain.

Envelope manufacturers are not rushed at present. A recent return from Ottawa shows that, since the imposition of the war tax on letters and post cards, the volume of mail matter posted in Canada has decreased by about thirty per cent. This naturally has had a rather reflex action on the amount of envelopes ordered by large firms, but it is believed that business this fall will materially improve. The orders for papetries, pads, etc. as well as fancy stationery for Christmas which have been given, are very satisfactory.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.85 to $1.90 at mill, in carload lots.
News (sheets), $1.95 to $2.05 at mill, in carload lots.
Book papers (ton lots), 4.25 c. up
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.25 to $3.75.
Manila, B., $2.25 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.00.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite (unbleached), $40 to $44, del. in Canada.
Sulphite (unbleached), $40 to $45, delivered in U. S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.10.
No. 1 soft white shavings, $1.75.

No. 1 mixed shavings, 40c
White blanks, $1.00.
No. 1 book stock, 80c.
No. 2 book stock, 50c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.10.
No. 1 print Manilas, 70c.
Folded News, 35c.
Over issues, 45c.
No. 1 cleaned mixed paper 27½c.
Old white cotton, $1.85.
No. 1 white shirt cuttings, $4.75.
Black overall cuttings, $1.37½.
Thirds, blues, $1.25.
Black linings, $1.25.
New light flannelettes, $3.75.
Ordinary satinets, $1.05.
Flock, $1.15.
Tailor rags, .95c.
Blue overall cuttings, 3.37½.
Manila rope, 2½.
N. 1 burlap bagging, $1.10.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft Pulp, $39 to $40.
Ground wood, $20 to $23, delivered in United States.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine)

New York, September 11.– Mechanically ground wood pulp has been exceedingly poor during the past few weeks. There has been practically no demand and the domestic inquiry has dropped off considerably. Just now, owing to the late heavy rainfalls, the rivers throughout the State have been well replenished to such an extent that news mills have been able to operate their own grinders at a good capacity. It is said that these mills have been availing themselves as much as possible of these conditions and have consequently put aside a large store for future use. Wood pulp grinders were considerably alarmed recently when reports were received regarding the unexpected outbreak of the Watertown strike. It had been believed that when the labor troubles in this section had been settled a short time ago that there would be no difficulties of this kind for a little while to come. The reports of the strike, however, have put a decidedly dark aspect on the ground wood situation. It is not only possible but probable that these mills will continue running their grinding machines storing up wood pulp while their consumption of this stock will have diminished greatly. This will, of course, do much to hurt the general business of the grinders. There appears to be a good foreign demand for ground wood for many manufacturers state they are confronted with numerous inquiries from many foreign countries for large quantities of stocks. If it were possible to take care of these inquiries it is undoubted that they would materialize in immediate business which would, of course, help to a great extent to relieve the conditions prevailing here. However, the shortage of bottoms and the absolute uncertainties of shipping at the present moment, make it impossible for these foreign opportunities to be of any assistance at the present time.

The movement of chemical pulp has been very slow. Paper manufacturers who have inquired regarding prices on pulp were met with exceedingly stiff quotations, much higher than those which prevailed a few months ago. Believing that conditions would ease off and that prices would soon become about normal the mills have shown a disposition to wait and have, as a result, not bought any great quantities of pulp. As a matter of fact, the situation has been very serious and it is problematical to what extent it will continue. In the minds of local imporers, there is no doubt whatsoever but that if pulp will continue to advance, there will be a considerable shortage for next year. During the past month there has been no tendency to sell stock below the prevailing market quotations. The fact is that the quantities of pulp now on American docks are much less than ordinary sixty days' supply. That this stock will be replenished to any extent seems improbable for many reasons. Recent imports have been very poor, in fact it has been shown that these shipments have been purely on old contracts and that they have been going into immediate consumption. Those importers who have been trying to contract for their customers for 1916 supplies state that it is absolutely impossible to make any satisfactory arangements with the foreign mills. Prices are very high and are destined to go higher. The Scandinavian mills are oversold far ahead. Owing to the fact that practically the whole of Europe has come into the Scandinavian market, the American mills have been entirely disregarded in the question of pulp distribution. With

England, France, Spain, Italy and now Germany all anxious to secure as much pulp as possible, and each paying the high prices quoted by the Norwegian and Swedish manufacturers, there has been no occasion to consider any of the demands made by American mills which usually are the most important outlet for the Scandinavian production. The feature of pulp no longer seems to be uncertain. It is pretty well decided that, owing to the high costs of raw materials and the sureties that they will not be able to be obtained at reasonable figures for some time, pulp may assume the same propensities which it displayed immediately after the outbreak of the war last year. Sulphur is contraband of war and is being shipped from this country at big cost and with great risk. Coal cannot now be secured from England owing to a total embargo which became effective on the first of the month. Shipments from the United States are decidedly uncertain because of the difficulties in obtaining ships. The coal question alone is thought to be sufficient to cause many of the foreign mills to shut down. Bleaching powder is at present scarce among the Scandinavian plants. Very little can be secured from England and comparatively little is being shipped from this country. Bleached pulp is now scarce and very firm. Unbleached pulp is acting sympathically. Krafts, etc., are hard to obtain at any price.

The rag markets are inactive with the exception of a brisk movement in roofing stock. Roofing is in very good demand and is being sought at good prices. The other grades are dormant. There is, however, every indication that rags will advance in the fall. Mills are not supplied with any great quantities of stock and it is certain they will have to come out into the market. Collections are very poor and there is actually a general shortage of all grades. This shortage will be strongly felt when the slightest demand is made. Because there is absolutely no hope of getting in large quantities of supplies from abroad it seems certain that domestic mills will be compelled to meet the demands of the dealers. Waste papers are not active. They are showing a tendency to improve. Mixed newspapers have been going better and have even advanced in price. Bagging is very firm and brisk. All grades of bagging are not plentiful and are expected to advance still more in a short time. Manila rope has advanced to $2.85 @ $3.00.

The paper market has not improved considerably. Various reports have come in from the West telling of the activity of most of the mills in that section of the country, but this activity does not seem to have refleced very strongly about New York City. Some of the jobbers talk of slightly better volume of business but on the whole no real change has been noted. The writing mills through Holyoke continue at a capacity of about 50 per cent and while they are hopeful for the best, admit that they have no real nucleus for such hopes. The question of dyes is occupying considerable attention on the part of manufacturers. Makers of newsprint look forward to very high market. The outbreak of labor troubles in Watertown will undoubtedly relieve the country of large sources of news and will make the market very much more firm than it is. As September and October are usually the months in which contracts are made, it is believed that quotations in this respect will be visibly affected. The export demands for news continues to grow and must eventually assist in the skyward movement of this market. Tissues are very weak. They seem to have lost their hold. No. 1 white can be bought without discretion. Added color has been reported in manilas. Prices have advanced and orders are in abundance. Fibres are very poor. Kraft papers continue dull. Papers are being shaded a bit but prospects are said to be very encouraging. Boards have taken on considerable life in the past few weeks.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.90c to 2.10c., delivered.
Bleached Sulphite, domestic, 3c to 3.40c, delivered.
Bleached Sulphite, impt., 2.70c to 3.00c. ex-dock, N.Y.
Easy Bleaching, impt., 2.25c to 2.45c. ex-dock, N.Y.
Easy Bleaching Pulp from 2.15c to 2.20 to 2.10c to 2.25c.
Unbleached Sulphate, impt., 1.85c to 2.05c., ex-dock, N.Y.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 1.90c to 2.00c.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $22 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $21 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

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"Do Your Bit."

It is with a good deal of pride that we call attention to the growing Honour Roll which appears elsewhere in the paper. Every man who goes Overseas to fight for King and Country is a hero, and deserving all honour. And yet men who enlist to crush Prussian militarism are, after all, only doing their duty. They are striking blows for national and individual freedom, ideals which have always appealed to man. No man or nation ever amounted to anything that was not prepared to defend liberty.

There are over sixty pulp and paper companies operating in Canada. They number among their employees thousands of young men, many of whom have neither home nor business ties sufficient to keep them from going Overseas. We wonder if the leading officials of companies have done their "bit" in stimulating recruiting among their men? It is, of course, well known that many of the heads of companies, the managers and those on whom the industry depends, cannot themselves go to the Front, but they can do much to encourage others to go. In many industrial plants throughout the country the managers have assured employees that all who enlist for Overseas service will have their jobs kept for them. This at once provides an incentive for volunteering. No man wants to give up his job and go away for a year or two, only to come back and find his place taken by a shirker. If he can be assured that his place will be kept for him, many a young man who is now hesitating will decide to "do his bit."

We would suggest that the heads of Pulp and Paper companies in Canada should at once assure their employees that those who enlist will be provided for, and feel sure that the response would be most gratifying.

This is our war. Flanders is our first line of defence. The young man who thinks that he has no call to go Overseas forgets, or fails to realize, that if the Germans break through that "thin khaki line" in France and Flanders, all is lost. It will be too late then to shoulder a rifle and shout "Down with Prussian militarism!" This is as truly our war as if the Germans were at Gaspe, and the young man who strikes a blow for King and country in Europe is as truly defending Canada as if he were fighting along the Lower St. Lawrence.

Pulp and Paper men have made a generous response to the call for recruits, but more men are needed. The Teutons are solidly entrenched on the Western front; in Russia they are continuing their drive into the heart of that Empire, while on the South they are preparing for a smash through Serbia to Constantinople. They are far from being a beaten foe. They appear to have almost unlimited resources in men, money and munitions ,and if we are to emerge from the conflict victorious, we must do better than we have been doing. More men are needed from Canada, and we trust that the employees of the pulp and paper mills throughout the country will loyally respond, so that the Honour Roll may soon be double its present length. Let us all do our "bit."

Sulphite Movements

The fact that the latest German loan is being offered in New York at a price which will yield almost 8 per cent. to participants, while the British loan is being over-subscribed at a price to yield about 5 per cent., fits with the condition that has recently been reported in the chemical pulp market. It is said that Germany has purchased from Scandinavia many thousand tons of sulphite. It would appear that the country is "living on itself," not only in the sense of using up the resources of the people and giving in exchange paper promises which the Government expects to redeem out of indemnities at the close of the war, but also in the sense of using its raw materials and factories for war purposes, making it necessary to get assistance from sources which previously it has not been necessary to tap—Germany's strong card in the pulp and paper game has been her sulphite. Chemical pulp has formed a great portion of German pulp and paper exports of upwards of £13,000,000.

If the report of the imports of Scandinavian sulphite be thoroughly well founded, Canadian sulphite manufacturers can indeed be sanguine over the outlook. Exports from Scandinavia to the United States will be cut off, and the value of Canada's natural market will be greatly enhanced. It would not be surprising to see a great advance, during the course of the year, in sulphite prices.

Arbour Day

A generation ago Arbour Day was observed in every school in Ontario with most gratifying results. It would be a good thing if the day were recognized in every school house from Atlantic to Pacific, as the practical lessons taught the children on that day remain throughout life.

To all who love trees, the present spirit of vandalism and wanton destruction shown by many people and corporations, causes feelings almost akin to pain. It is not an uncommon sight to see civic employees ruthlessly mutilate or destroy fine shade trees, because they happen to come in the way of a telegraph pole or some other so-called civic improvement. Trees which line streets and give them a distinctive appearance, are cut down without any thought of their value. The benefit of shade, the beauty of symmetrical, shapely trees, the freshness of the green leaves and the fact that trees enhance the value of property, mean nothing to the vandals who know little and care less about them.

Fortuntely there is an improvement in the public's attitude towards shade trees. Slowly but surely soulless corporations and incompetent civic employees are beginning to appraise trees at their proper value. It is now recognized that trees on a street add to the value of the adjacent lots. A row of fine trees along a country road not only adds to the appearance and value of the adjoining farms, but the shade and beauty give pleasure to passers-by as well as to the residents.

In our cities, parks, playgrounds and shady corners are like oases towards which poor unfortunate children flock during the summer months. Many streets in the poorer districts are absolutely devoid of all shade. There is no real reason for that. A few shade trees would add to the appearance of a street, and at the same time furnish the poor residents with a certain measure of comfort.

What is needed is an educational campaign which will make people realize more fully the beauty and utility of trees. This can best be started in the public schools through the proper observation of Arbour Day. From the school the good influence would spread to the home, and gradually throughout the nation.

Markets in France

The restrictions removed by the French Government on Canadian pulp and paper exports to that country should be of material assistance in building up business. It is, of course, only a war measure, but small trade openings started during the war may develop into important channels of commerce, when peace has been restored.

It is to be hoped that our paper makers will take advantage of the opportunity and endeavour to build up an export business with France.

The war has had a bad effect on pulp and paper makers, and upon newspapers. In Germany alone over 1,200 newspapers have suspended publication since the outbreak of the war. In Great Britain and France nearly all the papers have been reduced in size, and in some cases forced to suspend publication altogether. Even in Canada and the United States most papers have been forced to curtail, all of which affects the paper makers. For these reasons anything which might extend the markets of our local mills should be eagerly seized upon.

Freight Rates on Pulp

The application of Messrs. Auger & Sons of Quebec, City and the D'Auteuil Lumber Company against the proposal of the Canadian Pacific Railway to advance the freight rates on pulpwood from a number of Canadian points to Mechanicsville, New York, via the Boston and Maine Railroad has been refused by the Dominion Board of Railway Commissioners. The Board states that the rate increases proposed are reasonable and will go into effect November 1st. The new freight rates on pulpwood to Mechanicsville will then be 13 1-5c, instead of 10½c. via Sherbrooke and Lennoxville and 11 4-5c. instead of 9½c via Newport, from the points in question which are in the province of Quebec.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action, Feb. 28th, 1915.
WM. SMITH.
WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
GEO. ALBERT BROWN.
C. V. PERRY.
Sergt.-Major E. C. MORRIS.
SAPPER L. A. SWEEZEY, Queen's University Field Engineers.

Bird and Son.

JAMES BOATH.
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GILDDEN CAMPBELL,

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford and Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.
THOS. B. FORD,

Kinleith Paper Company, Limited.

Capt. C. STEWART-PATTERSON.
GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

The Laurentide Company, Limited.

M. JEAN ARHAN.
M. FRANCOIS DARCHEN.

Canada Paper Company.

Lieut. F. C. H. TYRON.

Price Bros. and Co., Limited.

G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. AMY, Jr., killed 31st May.
E. LEDGER.
A. BERNIER.
H. A. MOAT.
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W. TAPP.
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CHARLES GASPRE.

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Sergt. J. JOHNSON—"D" Company, 52nd Battalion, C.E.F.
LESTER L. LEARMONTH — "D" Company, 14th Battalion, 1st Contingent, C.E.F.
RICHARD CURRIE—2nd Artillery Brigade, C.E.F.

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A. L. BISHOP—2nd Battalion, 1st Contingent, C.E.F. On firing line since February.

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LEWIS SLOSSA.
ED. BAGHUM.

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MIKE ZUKOFF.
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NOTES ON THE DESIGN AND EQUIPMENT OF A PAPER AND PULP MILL LABORATORY

By "SNOW-SHOE,
Shawinigan Falls, Que.

The object of these notes is to give an idea of the arrangement of "any old room" in a mill for the purpose of carrying out the usual technical tests required by a mill making chiefly newspaper, but also mechanical and chemical pulp.

These notes are intended to apply chiefly to Canadian mills, the locations of which, generally speaking, are more or less remote from large cities and sources of chemical and scientific supplies.

In the running of a laboratory, say, 200 miles from the nearest chemical instrument dealer, it is evident that the operator must be ready to "make things do," and improvise apparatus, if need be; if the chemist is not prepared to do so, it means probably the laboratory will be run at an unnecessarily heavy expenditure for the year.

Canadian mills do not seem to be over done in the way of chemical help, and perhaps one reason is that mill managers and owners fancy that the cost of installing a laboratory is excessive; this is, however, not the case. A room can be fitted up to do all the necessary work at a comparatively moderate cost.

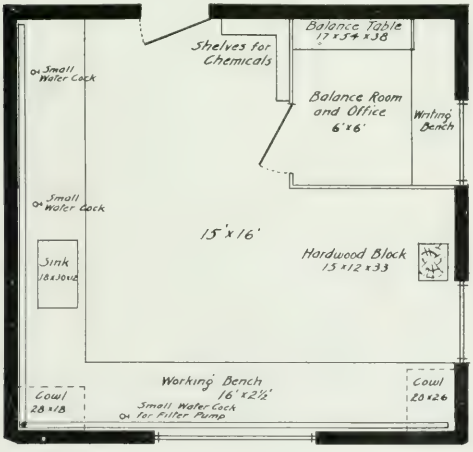


Fig. A

At the outset it may be said that certain kinds of more or less expensive apparatus are practically a necessity, otherwise it would mean a sheer waste of time on the part of the chemist, trying to make inferior apparatus do. For instance, certain platinum apparatus must be regarded as a necessity, and, indeed, may be regarded almost in the light of an investment, as platinum ware is always valuable, and if damaged may be sold as scrap metal at a high price. On the other hand, there are several pieces of apparatus which the chemical operator, if he is at all handy with tools, may construct for himself or have made in the machine shop of the mill, and thereby save quite a large sum in the equipment of the mill laboratory.

The majority of mills in this country have some hydro-electric power developments of their own, and so as convenient means are available for supplying heat to the laboratory in the form of hot plates, resistance coils, electric furnaces, etc. Any form of gas supply is quite unnecessary if electric power is available.

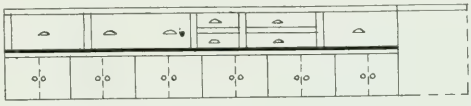


Fig. B

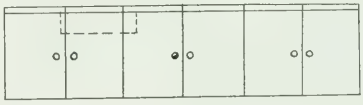


Fig. C

In considering the equipment of a laboratary for pulp and paper work, it is obvious that this would greatly differ from that designed for a steel works or explosive laboratory.

Pulp and paper mills are notoriously large users of steam, hydraulic power and lubricants, so that among the first considerations in the equipment should be means of properly examining fuels, greases, and oils of all kinds, belt dressings, also bearing metals, babbits, bronzes and brasses, and means of examining and testing paper and pulps, burnt lime and sulphur, china clay, rosin size, glue, dye stuffs, etc.

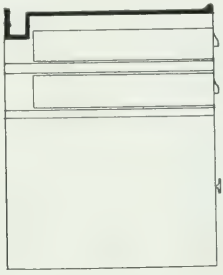
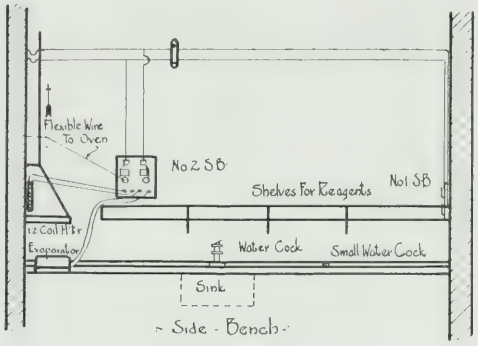


Fig. D

Considering the prevalence of typhoid fever in this country, any laboratory fitted up in the districts where paper and pulp mills are situated, would certainly fail in usefulness if it did not include in its equipment

the comparatively simple apparatus required for the ordinary analysis of water. It appears to the writer that too much stress can hardly be placed on this question of analysis of waters, as it is obviously in the interests of the mill management that the employees be kept in a good state of health. Intelligent examination of the water drunk by the mill hands is a matter of great importance, as the bacillus typhosus is no respector of persons.

Having enumerated some of the main work to be carried out in the proposed laboratory, the description of the equipment may be proceeded with.



- Fig - "E"

Our proposed room is approximately square, 15 feet by 16 feet to be exact, such as might be found or constructed in any mill; it is to be of good height, say not less than 10 feet, and with as much window space as possible, and preferably facing north.

Fig. A shows a plan of the laboratory drawn approximately to scale.

Fig. B is an elevation of the main working bench, showing cupboards and drawers, drawn to approximate scale; of course, these dimensions could be altered to suit individual tastes and ideas, but these sizes are very convenient.

Fig. C is an elevation of the auxiliary bench, containing a large sink, water cocks, etc., drawn approximately to scale.

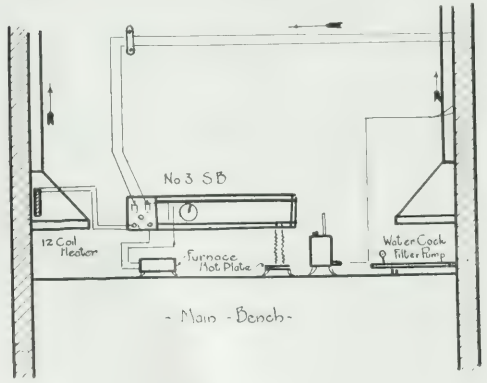


Fig - F-

Fig. D is a section of the working bench, showing the lead lined trough at back. The height of the benches from the floor, namely, 38 inches, is very convenient for the man of average height, and should not vary greatly from this.

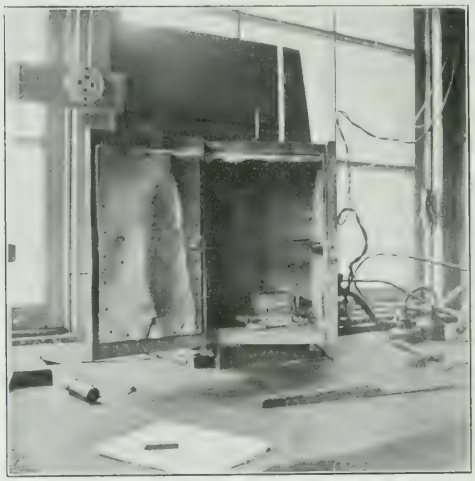


Fig. G.—Actual Photograph

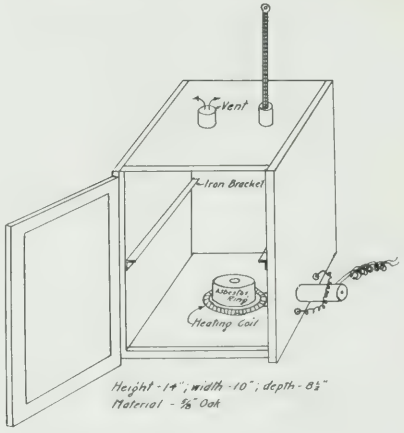


Fig. G

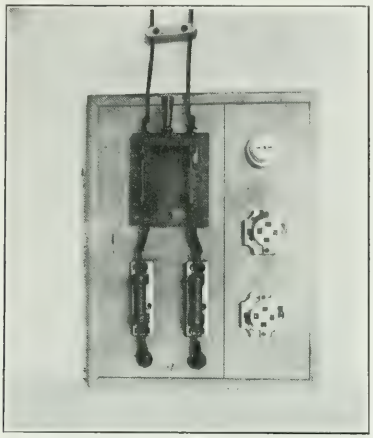
Fig. G.—Sketch

The construction of the benches is simple carpentery work, calling for no explanation except as regards the top, which has a trough built at the back, as in Fig. D, the front being raised about ½ inch, and the whole covered with sheet lead 3-32in. in thickness. Preferably the bench surfaces are given a slight inclination to the trough for obvious reasons.

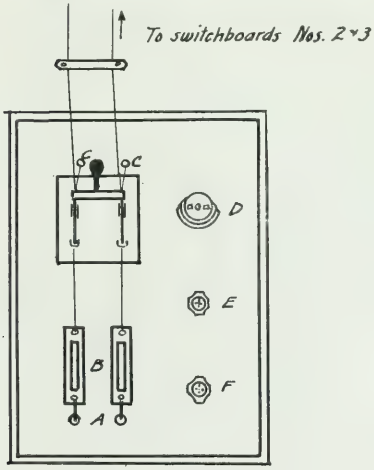
The sink is readily constructed by making a box of ¾ in. board of the required dimensions, cutting a hole in the bench, inserting the box and lining with sheet lead.

A large block of hard wood 15x12x33 fastened to the wall and floor, as in sketch, is very handy for pounding up materials and prevents the bench being knocked about.

The balance room and office must, of course, be constructed so as to cut off fumes from the laboratory entirely, and require no special description, except that the balance shelf must be solidly built to prevent vibration. This balance shelf is about 38 in. in height, and the writing bench about 34 in. above the floor; this latter is useful for microscopic work. A shelf or two for books, and two or three small drawers complete the room.



No. 1.—Actual Photograph



No. 1

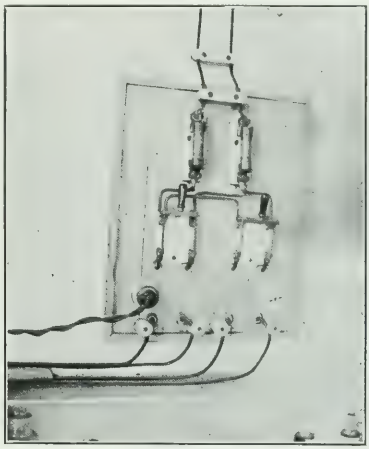
No. 1.—Sketch

The shelves for chemicals may be 7in. in width, spaced as follows—one 16in., one 12in., one 10in., one 9in., two 8in.; these sizes take the standard makes of bottles.

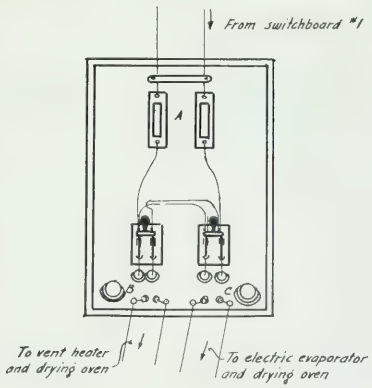
The two fume cowls are made of ordinary galvanized sheet iron, with vent pipes to outlets, and are each fitted with a row of 12 German silver resistance coils seven inches in length by 5/8in. in diameter, to create a draft.

As gas is in most cases not available for heating purposes, we must turn to electric power, which is conveniently supplied by a D.C. generator at 110 volts.

Three small switchboards will be required, as shown in sketches, the wiring of which can be readily followed.



No. 2.—Actual Photograph



No. 2

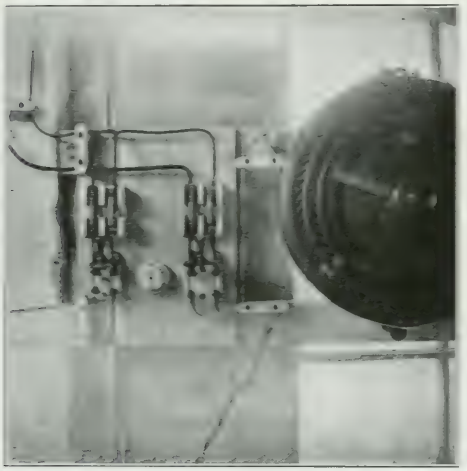
No. 2.—Sketch

In switchboard No. 1, the current centres at A. B. consists of two 40 ampere, 250 volts, enclosed fuses, while at C, branch wires are taken via the back of the board to three sockets—D for electric lamp, E and F for hot plates.

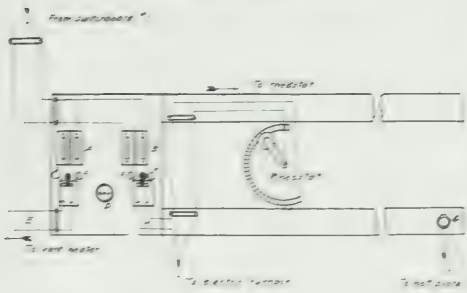
In Switchboard No. 2, A consists of two 40 ampere, 250 volts, enclosed fuses. As may be seen in the sketch, this wiring is arranged so that the current can be sent via the 12 coil vent heater plus the one coil drying oven (to be described later), or via a 12 coil evaporator plus the drying oven, by inserting a plug

in B as in C attached by a flexible wire to the drying arm rod. This arrangement has been in use a long while, and has been found to work satisfactorily.

Its switchboard No. 3, A comprises two 40-ampere, 250 volt, enclosed fuses. It is for same. The wires brought at F on the back of the board to socket D; the wires at E lead to No. 2 rear heater, consisting of 12 warm coils each.



No. 3.—Actual Photograph.



No. 3.—Sketch.

Fig. H shows the form of evaporator: it consists of a riveted steel iron box 24in. x 5½in. x 2 in., lined inside with asbestos board, and four longitudinal compartments formed by strips of asbestos board. Into these compartments, a dozen 7 inch coils of German silver, 8in. diameter, are laid three in each box, and joined up in series.

Fig. Ha shows the water container, which can be easily made from galvanized iron to fit into the asbestos lined iron box, and supplied with water by pipe as and as shown. The cover may be conveniently made a waste piece of sheet lead, the necessary small holes for evaporation being cut therein. As has been said, this is arranged in series, with the drying arm rod.

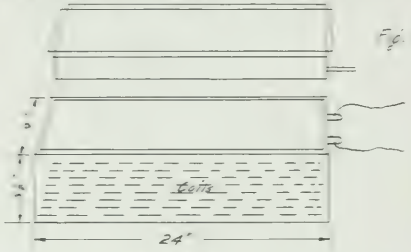


Fig. H

As a laboratory requires temperatures in excess of that of the electric hot plates (of which at least two will be required), it is necessary to consider this item. This is ruled out on account of expense, so the alternative method of heating by flame must be used namely by means of alcohol lamps. Two 4 oz. brass methylated spirit lamps are convenient and sufficient, but if a larger flame be required temporarily, a rough lamp may readily be constructed from an ordinary small stoneware ointment bottle which has a large opening of 1½in. and when fitted with a thick wick gives a

Fig. I.—Actual Photograph

large sized flame. This cheap substitute for a lamp is useful in boiling the water in water analyses for potassium, and for heating glass tubes, this latter job is not too easy to a laboratory using alcohol lamps, as one misses the familiar gas-ring burner.

Alcohol flames are not much use for ashing paper samples or coking tests on coal, and so that a still stronger source of heat must be considered; two present themselves, namely, gasoline blast lamps and electric resistance furnaces. The former is useful for heating crucibles, bending large glass tubes, etc., but does not recommend itself for making ash tests, the latter is useful for both kinds of work, and also for much

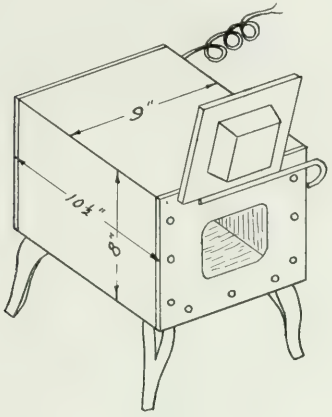


Fig. I

Fig. I.—Sketch

other laboratory work, and is highly to be recommended for installation in our proposed laboratory.

Fig. I shows a standard type of electric furnace, wound for 110 volts and taking 16 amperes, which is very suitable for paper mill work. The writer has used one of these for nearly three years without any

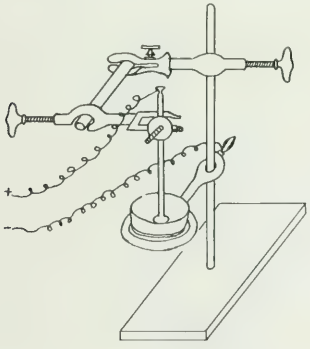


Fig. J

Fig. J.—Sketch

repairs being necessary. These furnaces are excellent for all ashing tests on paper, pulp, greases and coals, for calcimation tests on lime, etc., and as the temperature may be carried to 1,900 deg. F., many very useful experiments may be made in such an apparatus.

Supposing that no such furnace is available, it appears probable that with a little ingenuity, some high-resistance wire and some asbestos board, a rough apparatus could be made sufficient at least to do the ordinary ash tests on paper and pulp.

Referring to diagram of No. 3 switch board, a socket marked D makes a convenient connection for electrolytic analysis. No very special apparatus is necessary for carrying out some useful electrolytic determinations, such as, of copper and zinc in brass, copper and antimony in babbits metal. The ordinary platinum utensils required in the laboratory will come in useful for this work, namely, platinum dish of, say, 130 c.c. capacity, platinum crucible lid and piece of stout platinum wire; these, in combination with a rod of glass of about ⅝in. diameter, a wooden base, and three ordinary retort lamps constitute the outfit. Fig. J is a sketch of the apparatus.

The anode may be formed by bending the piece of platinum wire into a circle as in sketch, and laying thereon the crucible lid.

The wooden base of a filtering stand makes a convenient stand for the glass rod supporting the apparatus.. For the purpose of regulating the amount and E. M. F. of current supplied to the apparatus, one wire from the socket and plug is cut, and proper connections made to two or three lamp sockets. By the insertion of lamps of various powers a great variation in the current and voltage is obtained. This faked-up apparatus gives as good results as apparatus specially bought for the purpose.

As coal testing ought to figure largely in the works of the laboratory, the necessary apparatus for the

Fig. J.—Actual Photograph

proximate analysis of coal is to be considered. The moisture and ash tests may be performed in small porcelain crucibles, but small trays of stout platinum foil are much to be preferred; the coke test is carried out in a covered porcelain crucible, either over a blast lamp or in the electric furnace. For the sulphur test porcelain crucibles may be used.

For ascertaining the heat or thermal value of the fuel some form of calorimeter is needed. Many firms and individuals seem to think that the more money spent on elaborate calorimeters, the better the results obtained; this is not necessarily the case.

The bomb calorimeter gives highly correct results, it must be admitted, but it is also very expensive, and when one takes into account the difficulty of obtaining an absolutely representative sample, say, from a car of coal, the use of highly scientific calorimeters appears decidedly superfluous.

As a contrast to the expensive bomb we have the much-abused Lewis Thompson calorimeter, which can be bought for less than one-tenth the price of the former, and is generally considered a crude apparatus.

The writer has had many years' experience with the common L. Thompson apparatus, and has also used bomb and oxygen calorimeters, and can state emphatically that the Thompson apparatus is quite good enough to use for ordinary routine fuel testing, and when the results are compared with those from the bomb type the closeness of the figures are certainly remarkable. German scientists have pronounced the results from the Thompson calorimeter as "remarkably accurate for so crude an apparatus," so we will leave it at that.

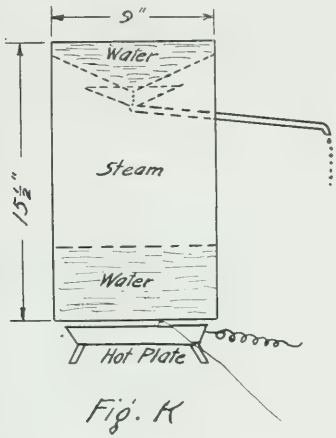


Fig. K

Another very necessary article, the water still, can be readily made in the machine shop from sheet copper, or, at a pinch, galvanized iron, in the form shown in Fig. K. This form of still is cheaply made, and takes up less room than the coil form of condenser and still.

The distillation is readily conducted over an ordinary electric hot plate. A good size of stil is 9 in. in diameter x 15 inches high. The body of the vessel should be logged with asbestos to prevent wasteful condensation on the upper side.

Three or four retort stands will be needed, these being also made in the machine shop of ⅜in iron plate and ⅜in. rod.; of course it will be necessary to purchase the necessary rings and clamps for these stands. The burette and filtering stands had better be bought rather than made.

Testing of colouring matters is an important item in the laboratory work, this being best done by direct test, that is, making hand made sheets of paper carrying known amounts of colour. For this, a small suction apparatus is very useful, which is easy to make on the premises, and is shown in Fig. L. It consists of a shallow metal box fitted with a valve at the bottom, the top being covered with a piece of fourdrinier wire, supported on stout brass wire inside the box. A movable wooden deckle is also made to fit on top so as to receive the diluted pulp mixture. The water is sucked away down into the conical filtering flask by means of a small brass water suction pump.

For the necessary operation of weighing, two balances will be needed, these not being things that can be improvised. For rough weighings, a balance on the Beranger principle with a set of weights up to 2,000 grams will be needed, while for finer weighings, a good class short beam chemical balance is essential with weights up to 50 grams.

The question of a microscope now presents itself; in the first instance, perhaps, the proposed laboratory may dispense with one, and rely on a powerful hand lens, but before long a good instrument will probably be found to be definitely needed.

For oil testing, the flash and fire points may be found by using a spun iron crucible, the viscosity may be observed by using the Saybolt instrument, which appears to be generally used in this country.

As to the water supply for the laboratory, one large water cock over the sink, and three small ones, as shown in Fig. A, are all that are needed.

The filter pump discharges direct into the back trough.

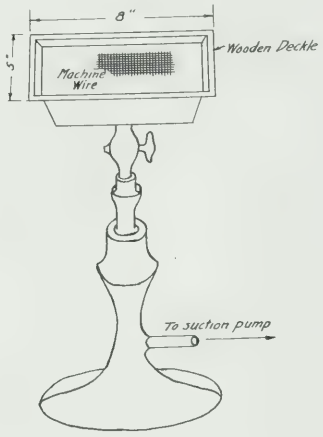


Fig. L

Of course there are other items which could be mentioned, but sufficient has been said to show how money can be saved in the fitting out of a testing plant where several important pieces of apparatus can be "home made," as has been described.

Turning to the question of general supply of glass ware and chemicals, etc., it is, of course, easy to turn up a catalogue and make out a long list of things necessary or unnecessary, but if the idea is to keep the outlay within reasonable limits, some care and thought is necessary while ordering.

List of Apparatus Required For Laboratory.

1 Students' Chemical Balance, cost about $20.
1 Set Balance weights, 50 grs. to 1 m.g.
1 Beranger Balance for rough weighing up to 2 kilos.
1 Set large weights, 1,000 grams to 1 Centigram.
Glass Beakers—Griffins' form with lip.
Half dozen of 100 c.c. capacity.
Half dozen of 150 c.c. capacity.
Half dozen of 250 c.c. capacity.
Half dozen of 400 c.c. capacity.
Two dozen 250 c.c. liquid reagent bottles.
Two 5-Litre glass bottles for distilled water.
A number of bottles of various sizes for general use.
Three test tube brushes.
Two 50 c.c. burettes, Mohrs' form.
Half dozen Mohrs' clamps.
Three Burette clamps.
1 small Liebig condenser.
I large Liebig condenser.
1 set of 6 cork borers.
2 gross corks of assorted sizes.
2 spun iron crucibles of 50 c.c. capacity.
Porcelain Crucibles with Covers.
Half dozen of 10 c.c. capacity.
Half dozen of 15 c.c. capacity.
Half dozen of 40 c.c. capacity.
1 Graduated glass cylinder, 100 c.c.
1 Graduated glass cylinder, 500 c.c.
1 Glass Desiccator cylinder, Scheibler's form.
Porcelain Evaporating Dishes.
Half dozen of 100 c.c. capacity.
1 Soxhlets' Extraction Apparatus, 100 c.c. capacity.
1 small triangular file.

Filter Papers.

1 Quire of good class paper in sheets.
1 packet C. S. & S. filters, 9 c.m. Black band.
1 packet C. S. & S. filters, 7 c.m. Black band.
1 packet C. S. & S. filters, 9 c.m. Blue band.
1. packet C. S. & S. filters, 12½ c.m. Blue band.
(For Analysis).
1 Small brass filter pump.
2 Bohemian glass flasks, 1 Litre cap. for wash bottles.
2 Normal resistance flasks of 1½ litres cap.
Half dozen Erlenmeyer flasks of 200 c.c. cap.
Half dozen Extraction flasks of 200 c.c. cap.
Two filtering flasks of 500 c.c. cap.

Volumetric flasks.

Two of 50 c.c. capacity.
Two of 100 c.c. capacity.
Three of 250 c.c. capacity.
One of 500 c.c. capacity.
One of 1,000 c.c. capacity.

Glass Funnels.

Three of 1½ inch diameter.
Three of 2 inch diameter.
Three of 2½ inch diameter.
Three of 3 inch diameter.
Two of 4 inch diameter.

Two Separatory cylindrical funnels. Cap. 250 c.c.
1 Kipp's apparatus of 500 c.c. capacity.
2 Electric hot plates.
1 Box of 100 gummed black labels, Dennison's 2004.
1 Book chemical labels.
2 Four oz. copper alcohol lamps.
1 Triple lens magnifying glass.
(1 microscope if thought necessary.)
1 Five inch porcelain mortar and pestle.
1 Nine inch porcelain mortar and pestle.

Glass Volumetric Pipettes.

2 of 10 c.c. capacity.
2 of 25 c.c. capacity.
2 of 50 c.c. capacity.
1 of 100 c.c. capacity.

Mohr's Graduated Pipettes.

1 of 2 c.c. capacity.
1 of 5 c.c. capacity.

Platinum Ware.

1 Gooch crucible 15 c.c. capacity.
1 Crucible and lid, 20 c.c. capacity.
1 Dish, 100 c.c. capacity.
1 piece of foil, 6 in. x 3 in.—1-500 inch. in thickness.
6 inches of fairly thick wire.

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1 Glass stoppered retort 1½ litres capacity.
2 Iron rings for retort stands, 4 inch. diameter.
1 Sheet iron sand bath.
1 Set of sieves, 40-80 mesh.
1 Steel spatula.
1 Burette stand for 2 burettes.
1 Wooden filtering stand.
2 Iron retort stands (machine shop.)
1 Test tube stand (carpenters shop.)
1 Water still, as in sketch above.
Rubber stoppers, 2 dozen of assorted sizes.
1 dozen books of blue and red litmus paper.
2 dozen test tubes.
Thermometers
2 Chemical Thermometers, reading up to 220 deg. F.
2 Chemical Thermometers reading up to 600 deg. F.
1 Extra quality thermometer for coal testing.
1 pair Crucible tongs.
Half dozen pipe clay triangles.
Half dozen Nessler tubes.
Three lbs. soft glass tubing, chiefly of 3-16 in. bore plus some pieces of assorted sizes.
Rubber Tubing:
12 feet of 3-16 in. bore.
3 feet of pressure tube.
Watch glasses:
Three of 2½ in. diameter.
Three of 3½ in. diameter.
2 lbs. glass rod, chiefly of 3-16 in. diameter, with a few pieces of assorted sizes up to half-inch diameter.

List of Chemicals Required for Laboratory.

NOTES.—W. Quart, means Winchester Quart, about one half gallon.

Except when otherwise stated, each salt is supposed to be chemically pure.

1 lb. Acetic Acid (Glacial.)
1 W. Quart Hydrochloric Acid, Pure.
1 W. Quart Hydrochloric Acid, Coml.
1 W. Quart Nitric Acid, Pure.
1 W. Quart Sulphuric Acid, Pure.
1 W. Quart Sulphuric Acid, Coml.
4 ozs. Tannic Acid.
2 lbs. Ethyl Alcohol, 95 per cent.
1 gallon Methylated Spirit.
1 W. Quart Liquid Ammonia, Pure.
½ lb. Ammonium Acetate.
1 lb. Ammonium Carbonate.
1 lb. Ammonium Chloride.
¼ lb. Ammonium Molybdate.
1 lb. Ammonium Oxalate.
1 lb. Ammonium Sulphide (solution).

¼ lb. Asbestos fibre (acid washed).
½ lb. Barium Chloride.
¼ lb. Borax.
2 lbs. Fused Calcium Chloride.
1 lb. Carbon Bisulphide.
1 W. Quart Petroleum Ether.
1 W. Quart Sulphuric Ether (Sp. gr. .735.)
¼ lb. Ferrous Ammon. Sulphate.
½ lb. Ferric Chloride.
1 lb. Ferrous Sulphate.
2 ozs. Glass Wool.
¼ lb. Iodine.
½ lb. Lead Acetate.
¼ lb. Magnesium Oxide Calcined (free from Sulphur).
½ lb. Paraffin Wax.
1 oz. Phenolphthalein.
½ oz. Phlowglucine.
½ lb. Potassium Bisulphate.
1 lb. Potassium Carbonate.
2 lbs. Potassium Chlorate.
½ lb. Potassium Chromate.
¼ lb. Potassium Ferricyanide.
¼ lb. Potassium Ferrocyanide.
2 lbs. Potassium Hydrate (Pure Sticks.)
½ lb. Potassium Iodide.
1 lb. Potassium Nitrate.
½ lb. Potassium Permanganate.
¼ lb. Potassium Sulpho cyanide.
¼ lb. Silver Nitrate.
1 lb. Sodium Bicarbonate.
1 lb. Sodium Carbonate (Extra Pure).
2 lbs. Sodium Chloride (Common).
2 lbs. Sodium Hydrate (Pure sticks.)
1 lb. Sodium Thiosulphate.
1 oz. Sodium Nitro-prusside.
1 lb. Sodium Phosphate.
1 lb. Sodium Sulphide.
1 lb. Sodium Sulphite.
½ lb. Starch.
1 lb. Zinc (Extra pure sticks).
½ oz. Methyl Orange.

The lists of chemicals and apparatus given above, while not very extensive, are about as much as will be actually required for some little time in the laboratory. Practically each one of the chemicals given will be used at one time or another. The quantities of the various chemicals given vary a good bit naturally, as some will be largely used, and others very little, but still used. Other chemicals may be needed at times, but their number will not be large. In the case of the very important article—the chemical balance, it would be undoubtedly best to purchase a good class one at the start, preferably a short beam balance, but a good students' scale will doubtless "fit the bill" for some time, and forty or fifty dollars be saved in the initial equipment thereby. The writer feels confident that anyone fitting up a laboratory on the above lines will not have wasted much money, also that the arrangement will be found handy and convenient. A laboratory on the above principle has been run for three years, and has proved satisfactory.

In conclusion it might be observed that within limits, an approximate idea of the cost of a simple pulp and paper laboratory might be arrived at by anyone interested by perusing this article.

The Cornish China Clay Trade

A SURPRISE RESTRICTION.

(Special Correspondence.)

London, England, Sept. 3rd.

An official notice prohibiting the general export of china clay, except to British possessions and Protectorates was issued from the London Customs House on Friday, last, August 28th, and only reached Cornwall during the early part of the present week. It is stated that shipments would be allowed under licenses granted on the recommendation of a War Trade department. So far the new order has had no adverse effect upon Fowey, one of the chief ports in Cornwall, because cargoes entered at the Customs House before the prohibition was issued are being allowed to proceed. It is not yet known what effect the new condition will have upon the clay industry in the county, but it is feared that difficulty will be created because of the necessity to arrange so far ahead for ships in order that merchants may procure their licenses. A week ago the War Trade Department issued a statement, in which it was explained that before licenses were issued the applications were sent to the departthese applications, and that these references naturally ment concerned to advise upon the grant or refusal of entail more or less time before an application can finally be dealt with in the department itself, but in the case of ordinary applications, where no difficulty arises, a license is speedily granted, usually within seven days. It is clear, therefore, that circumstances may arise which necessitate the withholding of a license for some time, thus placing the exporter who has to arrange for ships under certain disadvantages. At present about 50 per cent. of the china clay goes to the United States. The Cornish commodity has to compete with what is known as the American and Canadian domestic clay, and any handicap placed upon the merchants and shippers of Cornwall must benefit their American competitors.

Mr. J. G. Stephens, Consul for the United States for the South-West of England, said, "I have had information from shippers in different parts of Cornwall that the Government have prohibited the further exportation of china clay to countries other than British Possessions. Of course the Government have reserved themselves the right to issue licenses governing exportation, and it is hoped that under this condition the facilities which have existed in the past for shipping abroad will be allowed to continue as far as the United States are concerned, as in the past. Mr. Stephens mentioned as an idea of the value and amount of china clay exported to the United States last year from Devon and Cornwall, was 318,000 tons, worth, with the expenses of shipment, freightage and packing, over £400,000.

Mr. Reginald Martin, managing director of Messrs. Martin Brothers, of Lee Moor, Devon, and St. Stephens, St. Austell, said if the idea was that shipments of clay have been sent over to America, and thence back again to the continent, eventually reaching our enemies, through neutral countries, it was probably mistaken, as the cost alone would be prohibitive. In fact, once the china clay reaches the United States, the demand there for it is so general that there is no chance of its ever being sent back again. Mr. Martin

said there were certain restrictions with regard to the export of china clay to the Continent. All shipments to Holland had to go through the Netherlands Oversea Trust. This aimed at keeping the product out of Austria and Germany. In a conversation which our representative had with Mr. W. Rose, J.P., of Messrs. North & Rose, of St. Austell, he said it was quite possible that abnormal quantities of clay exported recently to Scandinavia had given the government authorities reason to suspect that some of it might be intended to reach Germany eventually. He understood a slight proportion of clay was used in the explosive factories. It was quite true that Germany, and also Austria, produced clay, but this was mostly in the south, and as the railways were being practically monopolized for military purposes, and the workers engaged in the war, the enemy might prefer to get their supplies overseas, if they could succeed in doing so. We think it is obvious that no clay that had been shipped to America, on which the outward freight and import duty had been paid, would be reshipped across the Atlantic in the hope that it may eventually, directly or indirectly, reach Germany. That is too extravagant a suggestion altogether, and we are hoping that whatever the restrictions on exports to Scandinavia or any other Continental ports, we shall be able to get the United States excluded from this order. Any interference with the export of clay to America will stimulate the development of the American domestic clay, and if people are forced to have and rely upon their home supplies, it will be very difficult to get the trade returned to Cornwall again.

Mr. F. W. Higman, J.P., of Messrs. J. W. Higman & Co., St. Austell, thought the new order would cause considerable inconvenience, but no serious handicap, to the trade. He had a vessel at Par loaded with clay for a French port, and on Saturday morning a telegram was received from the Plymouth Customs stopping her sailing. Representations were made by the brokers, and as the ship had "cleared" at Par she was allowed to proceed.

"I don't think it will affect the volume of trade," said Mr. Higman. "It is the kind of thing we have to put up with during the war. I think, if representation was made to the United States Ambassador in London, the restriction would be removed." Mr. Higman mentioned that alumina was the only ingredient he know of that could be used for war purposes. From it is produced aluminum, which has various uses. We understand the St. Austell China Clay Association will be meeting forthwith to consider the questions arising out of the new order.

W. TRETHEWEY.

RE-UNITED IN ENGLAND

An interesting letter recently received by a Quebec man tells the story of two Quebec boys who, after fighting side by side for months in the trenches, were wounded at the same battle but, taken to diferent hospitals and later reported to each other dead. They have just found each other in the thronged streets of London after mourning each other for over four months.

The men are Privates Joseph Rochette and Alfred Bélanger. Both belong to Quebec district and left with the first Canadian Contingent in August, 1914.

The two men worked together at the Grand Mère plant of the Laurentide Pulp Company.

Bathurst Lumber Company's Fire

Fire did a quarter of a million dollars damage to the Bathurst Lumber Company's plant at Bathurst N. B. on the 22nd of September.

The fire broke out in the afternoon and raged all afternoon and night destroying huge piles of lumber, the company's new docks and several of the mill buildings.

Sparks from the open burner operated by the Bathurst Lumber Company at the big mill in the village spread to the adjoining lumber piles and in a few moments a fire of some seriousness had developed. This blaze was discovered almost immediately, and efforts were made by the employes of the mills with the equipment at the plant to extinguish the flames.

The gale fortunately was from the northwest, which carried all the sparks out into the harbor, thus reducing the danger to the rest of the town. The steamship Galveston, loading at the dock, was compelled to move from its moorings and the company's two tugboats and several tugs belonging to the Northern Dredging Company also had to be shifted.

It was early seen that the Bathurst department would be wholly insufficient to cope with the blaze, and assistance was asked from neighboring towns.

According to information received by Douglas, Rogers and Company, of Amherst, who placed between $600,000 and $700,000 insurance on the Bathurst Lumber Company's property, the insurance loss on the fire will be more than 25 per cent of that total, or something under $150,000. Mr. Douglass said the insurance was divided among practically all the standard companies.

Mr. Angus McLean is President of the Company and Mr. A. G. McIntyre Managing Director.

DYE SHORTAGE AFFECTS PAPER MAKERS.

The Canada Paper Company has issued the following statement: Owing to the impossibility of getting some of the aniline dyes, which have their origin in Europe, we have had to change our formulae to produce certain colors. This may affect the sensitiveness of such colors, where the paper is used for special purposes such as where exposed to strong light; where subject to the fumes of ammonia, alkali, and guarantee the color of papers used for special purposes, unless arranged for beforehand. We trust to have your co-operation in this matter for our mutual benefit.

NEW PULP PLANT OPERATING

The new plant of the Canadian Guelph and Lumber Co. at Latchford, Ont. which was built on the site of the one destroyed by fire several months ago, was started yesterday. The machinery was found in good shape. It is the intention of the management to work night and day in order to catch up on the large stock of pulpwood now on hand.

A NEW MACHINE.

English engineers have succeeded in building a paper-making machine that will turn out 650 feet of newspaper, 175 inches wide, a minute.

Evolution of the Pulp and Paper Industry

Achievements in an Industry Typical of Modern Chemical Engineering.

By Thomas J. Keenan, F.C.S., Secretary of Technical Section of the American Paper and Pulp Association.

Within the period covered by the existence of the "Scientific American," no other well-established manufacturing enterprise, save perhaps the steel industry, has expanded so rapidly or developed so enormously as the pulp and paper industry. It must be noted as a remarkable feature of paper-making industry that, in basic processes, the principles of paper making have undergone no essential change during centuries of application. Paper remains what it was in the days of the Crusaders, or earlier, "an aqueous deposit of vegetable fiber."

The utilization of wood as a source of fiber, and the consequent evolution of paper-making machinery mark the beginnings of a colossal development in a business, which according to the Census of Manufactures for 1909, the latest report available, employed a capital of $409,348,505, and manufactured products of a value estimated at $267,656,964, giving employment to an average of 81,473 persons, of whom 75,978 were wage earners. The per cent. of increase of capital within the space of ten years from 1899 was 144.4; value of products 110.2 and persons engaged in the industry 53.7. The same rate of increase has not been maintained since 1909, though the period from 1909 to 1912 was one of unparalleled expansion, chiefly, however, in the Dominion of Canada, toward which the pulp industry, and particularly the manufacture of ground wood pulp, has been gravitating of late years, partly as a consequence of our tariff policy, but principally through the exhaustion of pulpwood forests within the borders of the United States.

Although ground wood pulp had been known since 1840 when Frederich Gottlob Keller took out letters patent in Germany for a wood-pulp grinding machine, the process of manufacture was not developed and applied for producing paper suitable for newspapers until a much later date. It began to be used commercially about the time of the discovery by Benjamin C. Tilghmann of the disintegrating action of sulphurous acid upon wood, which resulted in the invention of chemical wood pulp by the sulphite procress.

During the years that have elapsed since its introduction, comparatively few changes of importance have been made in methods of producing mechanically ground wood pulp. The logs of wood are still pressed against a revolving grindstone over which water flows, both to prevent carbonization and to carry off the resulting stream of pulpy fibers torn from the stem. Great economies of power, labor and space have, however, been effected by the use of new and improved forms of grinders. The rate and uniformity of production have been increased, especially by the use of tall magazine grinders introduced from Germany within the past three years. Grinders of the magazine pattern hold twelve cords of wood, which are sufficient to keep the stone engaged for a twelve-hour grinding period. The feed of the stone to the grinder box is regulated automaticaly by hydraulic cylinders operating on each side of the stone, so that the grinding operation may be continued during an entire night shift without attention.

A new order of things in paper making was ushered in with the introduction of chemical wood pulp. Then began the evolution of an industry typical of modern chemical engineering. After Tilghmann in America had pointed the way, George Fry and his collaborator Ekman developed at Bergwick, Sweden, the process of separating the cellulose of wood by boiling it under pressure in an aqueous solution of sulphur dioxide in which magnesium sulphite was dissolved. In the Ekman process, as first worked in this country, in the mills of the Richmond Paper Company at Providence, R.I., in 1885, the liquor used for cooking wood consisted of an acid solution of magnesium sulphite, the magnesia being obtained by burning magnesite imported from Greece.

Mechanical difficulties surrounded the operation from the outset, though the quality of pulp produced was excellent. The digesters in which the wood was cooked were lined with lead, and the heat developed in the acid liquor proved to be exceedingly disturbing, as while the lead expanded during the application of heat, it did not contract again when cold. The cost of repairs to digesters necessitated by the behaviour of the lead lining was heavy, amounting to $10 a ton on the total production. The difficulty was overcome by the invention of a digester lining composed of heavy cement backing faced with brick, the latter being pointed with litharge and glycerin. The invention of a digester lining was one of the important early contributions of the chemical engineer to the development of the industry.

The magnesium bisulphite process, originated by Ekman in Sweden, and developed by Charles S. Wheelwright and his brothers in this country at the Richmond Mill in Providence, R.I., has been modified in several important particulars, the chemical solvent now employed being bisulphite of lime. Many different kinds of pulp are obtained according to the system of cooking employed, the concentration of cooking liquor, time of digestion and the pressure employed.

The sulphite process of cooking wood is not applicable to all woods. It works best with spruce and coniferous woods generally. The Mitscherlich system of sulphite cooking, yields a product by prolonged digestion in a weak solution of sulphurous acid under low pressure. The resulting pulp is remarkable for strength of fiber. The wood is steamed for a few hours before being boiled with the acid liquor. The Rittner-Kellner quick-cook process is an improvement on the other processes, and is the one generally used in this country.

Perhaps the most important invention in pulp-making processes, especially in view of recent work in the ultilization of waste wood, dates from 1883, when Dahl introduced the sulphate process for the treatment of straw, a modification of which is now applied to the production of pulp from coniferous woods that are not amenable to other treatments. The operation of boiling in this process is carried out with a solution of caustic soda containing small amounts of sulphate and sulphide of soda. The sulphate of soda does not affect the wood, and is used as a source of alkali and sodium sulphide. The principle of the process depends on the fact that in soda recovery when the concentrat-

ed liquors are burned to ash, the sodium sulphate is reduced to sulphide by the carbonaceous matter derived from the wood, while the soda in conjunction with the organic matter is converted into sodium carbonate. The liquors are causticized in the usual manner, the lime converting the carbonate of caustic soda and having little action on the sodium sulphide.

The manufacture from sulphate pulp of strong brown wrapping paper, known in the trade as kraft paper, gives promise of a tremendous development in the Southern States, where there are immense quantities of yellow pine waste lumber excellently suited for conversion into pulp by the sulphate cooking system. According to figures compiled by G. F. Steele, of the American Paper and Pulp Association, sulphate pulp is imported from Norway and Sweden to the amount of 35,965 tons annually, and kraft paper to the amount of 10,250 tons, while the estimated imports from other countries is 12,085 tons. When it is considered that sufficient waste wood is available in our Southern States for the manufacture of 10,000 tons of this paper a day the opportunity that exists for the development of the industry needs no further demonstration. Kraft paper is now being made in Canada and in some of our Northern States at the rate of about 250,000 tons annually, and with the extension of the industry in the South we should soon be economically independent of other countries so far as this class of paper is concerned.

In the United States the development of the paper industry to its present proportions has taken place most rapidly within the past quarter of a century, for it is within that period that the evolution of paper-making machinery has been characterized by the greatest increase in size of units and consequently of productive capacity. From fourdrinier machines making news print paper of a width of 90 inches at a speed of 200 feet a minute, the fourdrinier parts have been lengthened and widened until to-day paper machines are actually in operation which have a width of 202 inches and are capable of being speeded up to 700 feet a minute.

In Germany, the improvements in paper-making machinery and in pulp mill equipment have kept pace with the general progress of invention in the arts and sciences characteristic of that country. Prior to the outbreak of war newsprint machines had been contracted for to run at a speed of 1,000 feet a minute, each being equipped with wires of 204¼ inches maximal width. These were and are to-day the largest paper machines yet ordered in the world.

The nearest approach to perfection in paper-making machines that has been attained in Germany was exhibited last year at the International Exhibition of the Book and Graphic Industries in Leipsic. The exhibition machine was not distinguished by great size or productive capacity, the fourdrinier part being only 65 feet long with a wire width of 106 inches, while its speed of production was limited to an extreme of perhaps 600 feet (525 feet normal), but the equipment of the parts represented the last word in machine design, including a "shake" of American construction with some essential improvements. It is permissible to mention the adoption by European paper machine builders of certain American inventions, as it goes to show how the engineering features of paper making have developed in the United States during recent years. Paper-making machines of American construction have been accepted as models by a number of European machine builders, and a considerable export business is done by American manufacturers of accessory apparatus, such as refiners of the Jordan-Marshal type and pulp screens.

With the progress of invention in machinery and accessory apparatus there has been a constant improvement of product, necessitated in part by developments in the printing art, which call for a great variety of papers of different qualities, which must be sold at a low price, notwithstanding a constant increase in prices of raw materials. The introduction of scientific methods and management in the paper industry during the past quarter of a century has made this possible. In 1879 the average price of all paper was $122 per ton, and in 1909 the cost per ton to the consumer was $56.

Making Munitions of War in England.

Owners of engineering works of all kinds are keenly, nay, vitally, interested in the new Act of Parliament, which gives the government power to take over any works or factories that might be considered suitable for the manufacture of munitions of war.

The position is indeed strange and unprecedented. No factory owner knows but that to-morrow he may be peremptorily ordered to cease his present manufacture, to obtain a new plant, and to commence the production of articles of a kind totally different from those which form the normal output of the factory.

Already this has actually happened in the case of certain motor factories, but in the majority of these instances the alteration in the nature of the output was made early in the war, and not infrequently at the direct request of the firms concerned. The latter anticipated that the war would result in a great slump in the demand for private motorcars, and therefore urged upon the government their ability to manufacture certain essential portions of shells and other parts needing great precision in manufacture, such as that which normally obtains in a motor factory, where the mechanics work to finer limits than is the case in any other branch of the engineering industry. Many firms were given special work of this character, though others were advised to alter their output only to the extent of producing heavy instead of light motors.

Under the new law it is conceivable that, for example, torpedo motors might be ordered by the government to be made, let us say, at a works normally engaged in the production of motorcycle engines. In general it may be assumed that the changes in the nature of the output will be made as far as possible to harmonize with what has been done in the works before, so that the experience of the workmen in handling certain machines and materials may be utilized to the best extent. Thus we should not expect to find rifle parts being made in a works devoted to boiler construction, though it would not come as a surprise to learn that at the latter mines were in course of manufacture.

With regard to the production of ammunition for rifles and guns, this interests the engineering works proprietor to the extent of the metal cases, bullets, and projectiles for such ammunition, the manufacture of the necessary explosives coming primarily within the purview of chemical firms, many of whom could change the nature of their output without great difficulty.

In the Birmingham metal trade there are plenty of firms perfectly familiar with the working of sheet brass, who, if they were able to obtain the necessary machinery, could soon set their men to work on the manufacture of cartridge and shell cases, as well as of nickel-cased bullets. To extemporize in the matter of the production of shells would not be so easy a matter, and probably the soluiton of this problem lies in the continuous expansion of existing works, though many entirely new enterprises in this direction are rapidly maturing.—The London Daily Telegraph.

Paper Dyeing With Natural Dyes

Natural dyes fall under two heads, mineral or inorganic coloring matters and dyestuffs produced by vital processes in either animal or vegetable tissue and extracted from it for dyeing purposes. The papermaker uses many of both sorts, and we propose to give a short, but yet sufficiently complete, exposition of the application of natural coloring matters to paper, but at the same time we include dyeing by means of inorganic coloring matters produced on paper or pulp by artificial chemical processes.

Inorganic Dyes Generated on the Fiber.

1. Iron yellow (hydrated sesquioxide of iron). To produce this the pulp is first mixed with a solution of ferrous sulphate ($FeSO_4$) in quantities proportionate to the depth of shade required from a pale yellow to a deep reddish yellow. Then a solution of lime or soda is added to precipitate the oxide of iron on the paper fiber. Both operations are conducted in the beating engine. The color at fist produced is a dirty green, but constant exposure to the air secured by the circulation in the hollander soon converts that by oxidation into the proper color. If, however, the yellow or color has to be produced very quickly, the ferrous sulphate can be replaced by a ferric salt.

The colors formed are perfectly fast to light and alkalies, but loose to acids. They may be topped with ochres, whereby they not only gain in fastness, but may be obtained in a greater variety of shades. The artificial ochres have a far smaller color range than the natural ochres. Unlevel shades can often be corrected by this topping.

2. Manganese Bronze or Bistre. This is produced in the same way as the iron yellows and browns, except that a manganese salt (usually manganous chloride, a by-product of chlorine manufacture) is substituted for the iron salt. When the pulp has been thoroughly mixed with the chloride, caustic soda is added, whereby the brown peroxide is thrown down. A little hypochlorite can be mixed with caustic soda lye to hasten the effect. The brown color given to the pulp is very fast to light and to either acid or alkali. Here, too, the color can be topped with brown ochres whereby deep shades can be more cheaply got than with manganese only.

3. Prussian Blue. Blue color was at one time produced on paper solely by precipitation in the hollander with ferrocyanide and a ferric salt. At the present time the same process is used, but in most cases only a light blue color is thus given to the pulp as a mordant for coal tar dyes. In this case the process is as follows:

The pulp is dyed iron yellow as above described. It is then mixed with a cold solution of ferrocyanide, and soured with one pound of concentrated sulphuric acid for every two pounds of solid ferrocyanide employed. The darker the iron yellow ground the darker does the blue come out.

Another method is to add to the pulp an appropriate quantity according to the color desired, of a mixture of three parts by weight of ferrous sulphate, two of potassium ferrocyanide and one of concentrated sulphuric acid. If an indigolike shade is required the green vitriol is replaced by nitrate of iron, to which 2 to 3 per cent of tin salt has been previously added.

The following are two approved recipes for making prussian blue mordant:

1. Forty lb. of sodium nitrate is dissolved in 8 gallons of water, and 2 lbs. of concentrated sulphuric acid are added after solution is complete. After this clean iron filings are put in as long as they continue to dissolve and more. The presence of undissolved iron is the only guarantee of the efficiency of the mordant.

2. Iron filings are dissolved in somewhat dilute nitric acid (say 4 lbs. of the commercial acid to one of water). Here again the iron must be in excess, and the filings should be put in a few at a time, waiting till the evolution of gas caused by each addition ceases before any more is put in. In both cases the mordant is finally boiled up and allowed to settle. The clear solution is decanted for use, and marks about 40° B.

As regards the topping, logwood extract is much used from wrappings and brightened with methyl violet and brilliant green.

The pulp dyed by these methods must be made perfectly free from acid or the paper will be apt to turn red at the edges. This purification must be done before any filings are put into the pulp—Herbert Robson, B. Sc., in "Paper Making."

TO BUILD.

Work is about to start by day labor on the construction of a crib work dam. The city of Sherbrooke, the Brompton Pulp and Paper Company, the Paton Manufacturing Company, Sherbrooke, and the Sherbrooke Street Railway Company are interested in the project.

NEW PULP MILL.

The Metagami Pulp and Paper Company are about to commence operations in connection with the establishment of a pulp and paper mill on the Metagami river, 30 miles west of Cochrane.

BUYING QUEBEC PULPWOOD.

The Berlin Mill Company, of Berlin, N.H., has just completed a contract, through their agent Mr. W. A. St. Laurent, for twenty-four million feet of wood, in the vicinity of Chartierville, to be delivered at the rate of four million feet a year. Preparations for the work are already going on, and the operations will begin towards the end of October.

A TRADE OPENING.

Jno. Crocker & Co. paper makers agents of 125 Edmund St., Birmingham, England, are desirous of getting in touch with paper mills able to export to the United Kingdom.

UNITED STATES NOTES

Charles H. Fish, general manager of Russell Falls Co. of Russell, Mass., has been appointed receiver. The company employs about fifty people. Mr. Fish has been general manager of the company, directing its affairs from Boston. The company has several large orders on hand, and it is expected work will be resumed under the receivership.

* * *

The paper mill at Lancaster, O., recently purchased by H. P. Peters, will be in active operation within the next sixty days, according to statements made by Mr. Peters and F. C. Reevolt, the new general manager of the mill. New machinery has been ordered, and as soon as it arrives it will be placed in position. Mr. Reevolt, who worked under the former management, has opened the mill, and with a force of men, is getting things in shape to run, which it is thought will be in the neighborhood of two months. A superior grade of wrapping paper will be manufactured at first, and it is quite likely that later the plant will be equipped for making a better grade of paper.

* * *

The capital stock of the Neenah Paper Company of Neenah, Wis., has been increased from $200,000 to $400,000, and the board of directors has been increased from four to seven. The personnel of both the company and most of the board of directors is the same as that of the Kimberly-Clark Company. James A. Kimberly, of the Kimberly-Clark Company, is president also of the Neenah Paper Company.

* * *

Rapid progress is being made on the two additions being erected by the Western Board & Paper Company. The roof work is now being done and the contractors believe that within another two weeks the buildings will be nearly finished. The additional room is badly needed by the company, and for that reason every effort is being made to have the buildings finished within the specified time.

* * *

An interesting bulletin on ground wood pulp is being prepared at the Forest Service at Washington, D.C. This bulletin takes up the question of substitutes for spruce in pulp making. While this subject is not new to the trade, according to reports, some interesting statistics will be contained in the bulletin which will allow the mills to go ahead with the substitutes with more assurance of success than ever before. The bulletin will probably not be ready for distribution for six weeks or two months yet.

* * *

The D. M. Bare Paper Company, Roaring Spring, Pa., contemplate the building of a plant for converting the lime waste or sludge, now discarded, into lime of the highest quality. The system employed will contain a number of novel features not heretofore incorporated in such plants.

* * *

The Defiance Paper Company of Niagara Falls, N.Y., plans the erection of a new pulp mill near its plant in lower Walnut Avenue, that city. Plans for the mill have been drawn by Wright & Kraemer, architects, and bids on the work will be called for in a few days. The building will be of concrete reinforced steel construction, 90 x 60 feet, part two stories high and part one. The estimate cost of the building is $12,000.

* * *

The big foundation walls for the new Rex Paper Company at Kalamazoo, Mass., are being built at the present time, and the contractors hope to have this part of the work done within the near future. The girders will be placed shortly, and every effort will be made to push the building to completion, before bad weather sets in. The Weber Company, of Chicago, has been given the contract to erect the new stack, and the Wicks Company, of Saginaw, Mich., got the boiler contract.

* * *

A reorganization plan has been going on in Stone & Andrews at Boston, Mass., the last few weeks. Messrs. Stone and Esty have resigned from the corporation, and Frank E. Guptill has come into the corporation in the position of treasurer, and Carl E. Lincoln, as vice-president. Mr. Andrew is, as before, president and general manager of the corporation. Charles A. Esty will form the Charles A. Esty Paper Company. The new concern will have a store in the Burgess Lang Building, Worcester, and a Boston office at 31 Milk Street.

* * *

Work on the new plant of the Oswego Falls Pulp & Paper Company, Fulton, N.Y., is going along well. The pulp mill and storehouse buildings are rapidly nearing completion and the work of excavating and putting in concrete foundations for the new power house is being rushed in order to complete the plant by the first of January, according to plans.

* * *

A system of conveyors is being installed at the plant of the Victoria Paper Mills Company, Fulton, N.Y., to facilitate the handling of coal. A spur track has been laid, by Ontario and Western Railroad, on the abandoned canal lands just back of the mill, and the conveyors will take the coal direct from the cars to the boilers. An addition is being made to the storehouse of the company, which is situated along the new spur track, and this will improve greatly the shipping facilities of the plant.

* * *

Press dispatches state that Detroit, Mich., is to have a new paper mill. The promotion of the enterprise is in the hands of Percy Chandler, of Chandler Bros., brokers, of New York and Philadelphia. It is claimed that the syndicate has secured control of a large pulp wood supply, and that owing to easy water access, the cost of transportation would not be great. It is said the new corporation is composed mostly of Detroit newspaper publishers who intend to use the product of the proposed mill.

* * *

Matches and rags furnished a combination that threatened the existence of the mill of the Whiting Plover Paper Company at Stevens Point, Wis., during the past

fortnight. Fortunately employers discovered the blaze before it had gained much headway. The automatic sprinkling system, coupled with prompt action on the part of employees, extinguished the fire before much damage was done.

* * *

Statements are made in New York circles to the effect that the Pearsite Co. of the city, and Pittsburgh, are the owners of a new invention for making coal tar dyes, which may revolutionize the industry and end the control of the American market by German manufacturers. Details are withheld, but it is understood that the company will have a plant producing five tons a day by December 1, for making red dye suitable for the manufacture of tissue, blotter, cover paper, and colored boards. The Government investigator says that while there are a number of natural color dyes, there is no pronounced red available, and that this new color would be welcomed. The secrecy as to the interests back of the new process for making coal tar dyes, which, according to Dr. Thomas H. Norton, Government color expert, may revolutionize the industry, and end control of the American market by German manufacturers, was partly dispelled last week, when it developed that the Pearsite Company, a newly formed corporation, controls the invention. The company has an office at 346 Broadway, New York, as well as in Pittsburgh.

* * *

During the past fortnight the union men of the mills of the St. Regis Paper Company, at Deferiet, N.Y., the West End Paper Company, and the Champion Paper Company, at Cathage, the Remington Paper & Power Company at Norwood, Norfolk and Raymondville, and the Continental Paper Bag Company of Watertown, were called out on a renewal of the strike which had existed in these mills till summer. As was expected, the conditions were far more serious than during the former strike, which had been settled only two weeks prior. For several days representatives of the labor organizations involved the State Industrial Commission, and the paper companies were in conference in an attempt to stem the gathering storm of dissatisfaction among paper makers. The commissioners used every effort, without success, to avert the trouble.

"WAREHOUSE-A-BALE"

Last year when the war broke out the Southern States had a huge cotton crop on their hands for which the demand was greatly restricted. Every possible means was taken to relieve the situation, one method being conducted under the slogan of, "buy-a-bale of cotton", and no doubt it caught the public fancy in the right manner. This year there is another large crop, smaller than usual, but still greater than requirements, and every effort is being made to assist the cotton growers to warehouse their cotton in order to maintain the proper supply on the market. The slogan is now, "warehouse-a-bale", which means that this winter, when a southern grower needs money, he will not be forced to sell his crop. In the prevailing market prices which allow little or no profit. Instead, he will put the necessary number of bales in a standard warehouse, get a receipt for them, and then borrow 7 cents on a pound from the United States with his cotton as security.

Ottawa Notes

Ottawa, Ont., September 25.—Pulp and paper companies which cut their own wood are experiencing great difficulty in securing good men to go to the bush this year. Three months ago, there were hundreds of unemployed men in Ottawa ready to go into the woods, or do any other kind of work. But the internment of so many foreigners in Canada, and the recruiting for soldiers, has caused a change. It is still believed that there are hundreds of men in the district ready to go to the bush, but that they are holding out for an increased wage schedule instead of the $16 to $22 which is being paid this season, as compared with $20 to $28 last year. They prefer to hang round the cities and take odd jobs rather than go to the camps, where, they claim, they are not getting a square deal, and that the $20 per month which they may receive is not enough to support a family.

Supplies for the camps this year are, however, much cheaper than they were at this time a year ago. For instance, sugar is $1 per cwt. cheaper than last fall; oats about 25 cents per bushel; hay, $3 per ton; pork, $1 per barrel; flour, $2.50 per barrel cheaper.

Two heavy storms within the last two weeks did some damage to Ottawa pulp and paper plants. The first which only lasted about 15 minutes, blew a portion of the roof off No. 1 paper mill at the J. R. Booth plant, and also left its mark on about fifty lumber piles. Fortunately those employed in the mill were absent at the time attending the Central Canada Exhibition, for which they had been given a half holiday. Last week came another storm during which part of the electrical equipment of the E. B. Eddy plant was struck by lightning, causing a blaze. The Hull City and Eddy fire brigades turned out, but the flames were extinguished by the heavy downpour, and no damage was done.

The Canadian pulp and paper industry will have another representative at the front in the person of Mr. J. R. Booth, Jr., son of Mr. J. F. Booth, of the pulp and paper firm of that name, and grandson of Mr. J. R. Booth himself. Mr. Booth, Jr., has offered for service with the Canadian aviation corps and will take the training course at Toronto. He is twenty years old.

On November 1, the Boston and Maine railroad will put into effect increased rates on pulpwood from points in Quebec Province to Mechanicsville, New York. The Railway Commission has refused application of the D'Auteuil Lumber Company to have the proposed advances disallowed, and consequently the rate via Sherbrooke and Lennoxville will be 13 1-5 cents instead of 10½ cents, and 11 4-5 cents instead of 9½ cents via Newport.

Mr. J. R. Booth has suggested to the Ottawa municipal authorities that he be given a fixed assessment on his lumber and pulp and paper plants. He is now the largest taxpayer in the city. In support of his contention, Mr. Booth points out that as the matter stands he has to pay higher taxes every time he replaces old, inflammable structures at his millsl with new, fireproof ones, although the new buildings bring him in no more revenue. The E. B. Eddy Company, on the other side of the river, has enjoyed a fixed assessment from Hull for a number of years, which has just terminated.

MAC.

PULP AND PAPER NEWS

W. J. Gage, President of the Kinleith Paper Mills, St. Catharines, and W. J. Gage and Co., manufacturing stationers, Toronto, is President of the National Sanitarium Assocation, and lately a tag day was held in Toronto at which over fifteen thousand dollars was raised for the Queen Mary Hospital for consumptives. It was known as "White Rose Day." Mr. Gage recently received, through their Royal Highnesses the Duke and Duchess of Connaught, a message from Queen Mary congratulating the ladies of Toronto on the successful results of their work.

The Trent River Paper Co., of Frankford, Ont., makers of straw and wood board, have resumed operations after being shut down for a few weeks, in which the plant was thoroughly overhauled, and improvements made to the dam on the Trent river, including the building of new bulkheads. The company will manufacture several new specialties in the board line.

W. D. Woodruff, President of the Lincoln Paper Mills, Merritton, Ont., recently donated a machine gun to the Department of Militia and Defence, and was instrumental in raising sufficient funds from a number of the business men in the Niagara Peninsula to provide for a second machine gun.

John Martin, of the John Martin Paper Co., Winnipeg, is spending a few days in Toronto, Montreal and other points east on business. He reports that trade in the paper line in the West is improving, and a good fall turnover is looked for. Mr. Martin has been for some time devoting considerable attention to forming a Canadian Paper Jobbers' Association, and, while the proposal has met with a good deal of encouragement, the responses have not been sufficiently enthusiastic to warrant a meeting being called at present. Many members of the trade feel that they should wait until the war is over and things are settled down to a better basis. Mr. Martin says all agree that a Paper Jobbers' Association could discuss many abuses that the trade is now suffering from, and he believes that, if the members got together, many of the evils could be rectified. The movement is a good and necessary one, and all could co-operate with much benefit, but the present is not just the time to carry matters to a conclusion.

Hon. G. Howard Ferguson, Ontario Minister of Lands, Forests and Mines, Toronto, was at Kemptville, Ont., last week, attending the funeral of his mother, who was the widow of Dr. Charles Ferguson, a former member of Parliament for Leeds and Grenville. She had attained the age of seventy-five years.

An attempt to have Sunday newspapers sold in Canada has been frustrated. A deputation from Windsor, waited upon Hon. I. B. Lucas, Attorney General of Ontario, recently, and asked that he authorize the sale of American Sunday publications in that city. The application was opposed by the Rev. W. M. Rochester, Secretary of the Lord's Day Alliance, who pointed out that it was specifically provided in the Federal laws that foreign papers should not be imported or sold in Canada on Sunday. Mr. Lucas informed the deputation that no action could legally be taken to grant the request of the deputation, and that if such papers were sold, prosecutions would follow.

George H. Cowan, former Member of Parliament for Vancouver, who was in Toronto last week, reports that the lumber industry on the Coast has touched rock bottom, and that conditions are now improving. The trade has been sadly hampered by poor shipping facilities, but these are now getting better.

The members of the Ontario Pulp and Paper Makers' Safety Association, along with those of the other different branches of the Canadian Manufacturers' Association, have completed their plans for the work of the accident section. There are twenty-one sections of the Association, and each will employ one inspector, who will inspect all factories and workshops of the members of the Association. Each inspector will make duplicate reports of his findings, one of which will be sent to the Central branch of the Safety Association, and the other to the Workmen's Compensation Board. The latter body is working in harmony with the manufacturers, and the reports of the inspectors will be taken by the Board and dealt with by them.

G. A. Kingston, a member of the Ontario Workmen's Board, has gone to Seattle to attend the annual convention of the National Association of Workmen's Compensation Boards. There are twenty-ve states of the Union that have workmen's compensation acts.

Thomas Gain, sales manager of the Don Valley Paper Mills, Toronto, has returned from a successful business trip to Winnipeg and other points west.

The Nicholson Lumber Co., Limited, of Burlington, Ont., has been granted a charter. The capital stock is $25,000, and the company can engage in the manufacture of lumber and box factory products. Among the incorporators are A. S. Nicholson, S. A. Dearing, E. C. Peart and John Nicholson, all of Burlington.

The Noel-Mackay Lumber Co., Limited, of Fort Frances, Ont., has been chartered with a capital stock of $100,000 to carry on business as timber merchants and saw mill proprietors, and to deal in timber and wood of all kinds, timber concessions, etc. Peter J. Noel and James MacKay, of Fort Frances, are among the incorporators.

Western Timber Corporation, Limited, with headquarters in Kamloops, B.C., and a share capital of $500,000, has been granted a federal charter, to carry on business as loggers, lumbermen, etc., and to own and operate lumber mills, pulp and paper mills, etc. James C. Shields and David W. Rowlands, of Kamloops, are the men behind the enterprise.

J. T. Mix, who was recently appointed general sales manager of news print for Price Bros. and Co., and now has offices at 30, East 42nd St., New York City, was in Toronto last week on business. He was accompanied by John Ball, manager of the manufacturing department of the company.

A writ has been issued at Osgoode Hall, Toronto, against the Abitibi Power and Paper Co., of Iroquois Falls, Otn., for damages for alleged negligence, resulting in the death of B. Ordechuk. The hearing will come up at the fall assizes.

A provincial forester will shortly be appointed by New Brunswick, to survey the Crown Timber lands of the province, as provided in the Act of 1912. The Crown Lands comprise an area of over ten thousand square miles, or about one-third of the total area of the province, which derives an annual revenue of over half a million dollars from these lands.

The Kippewa Lumber Co., Limited, has been incorporated with a share capital of $50,000, and head offices in Ottawa, to carry on the business of lumberers and timber merchants, and to manufacture pulp, paper and other products. Among the incorporators are Charles E. Read and F. W. Avery, who are widely known lumber merchants of the capital.

The Belgo-Canadian Pulp & Paper Company have transferred their General Sales Office and Order Department from Shawinigan Falls to 51 St. James street, Montreal.

The Pulp and Paper Magazine acknowledges receipt of a new edition of Walden's A. B. C. Guide. This publication becomes better each year, and its annual appearance is eagerly looked for by the paper trade.

The Brompton Pulp and Paper Company has sent a letter to the press in which they take issue with the statements made by Mr. Cousineau, leader of the Quebec opposition.

The Cape Breton Pulp Company at St. Annes has given a contract of a rebuilding of their plant at that point. The former building was destroyed by fire some time ago.

The new plant of the Canadian Pulp and Lumber Company, at Latchford, which was built on the site of the one destroyed by fire several months ago, has started operations.

A contract has been completed by the Berlin Mill Company of Berlin, N.H., through their agent, Mr. W. A. St. Laurent, for $24,000,000 feet of pulpwood in the vicinity of Cartierville, P. Q. to be delivered at the rate of 4,000,000 feet per year. Preparations for the work have been commenced and the actual operations are expected to begin about the end of October.

Plans are being prepared for the erection of a pulp mill for P. H. Renaud, at Lake Megantic, P. Q.

The Star Lumber Company's shingle mill at Revelstoke has been completely destroyed by fire. All the machinery, including an overhead tramway and the boiler and engines, were wreckd. The loss is estimated at $10,000.

The coast lumber mills report considerable enquiry for export, but the trade is restricted by lack of bottoms for shipment. Considerable orders have been received from the British Government, who are providing ships to carry the lumber from Vancouver. Upwards of twenty million feet have been arranged up to the present and further orders are in sight. The demand from the prairies is improving, and mills in the in the interior report better conditions.

British Columbia has 15,000,000 acres of standing timber.

An order-on-Council will soon be passed by the Quebec Government making it obligatory on all timber operators to clean up their lands to a depth of 100 feet from the edge of the right-of-way of any railroad passing through their land.

The preservation of the British Canadian Lumber Corporation on the basis recommended to the shareholders and noteholders by the receiver at a meeting held in London in May last is assured. It is stated that over $400,000 of the $550,000 receiver's certificates have already been taken up and that satisfactory arrangements can be made regarding the balance.

The National Forests turned into the United States Treasury during the fiscal year ended June 30, 1915, nearly $2,500,000, an increase of more than $40,000 over the receipts of the previous year, according to a statement just issued by the Forest Service.

The Laurentide Co., Ltd., will finish its season's planting operations by planting 90,000 Norway Spruce, three-year-old seeded. Plantations previously made have made exceptionally good growth this season.

Prof. Frank B. Moody of the Cornell Forest School and formerly assistant State forester of Wisconsin has accepted the appointment as a member of the State Conservation Commission of Wisconsin. This Commission is the consolidation of the State Board of Forestry, State Park Commissiou, State Fishery Commission and Game Wardens Department.

The Department of Lands and Forests of Quebec, in co-operation with the Laurentide Company, Ltd., have set aside a tract of about four square miles of practically virgin timber to be used as an experimental tract. The Chief Forester, Mr. Piche, and the Company's Forester will decide on methods of cutting and brush disposal and these will be carried out under careful supervision, and the costs of different methods and their effects on the stands and on regeneration will be carefully studied. Much valuable information should be obtained.

A GREAT INTERSTATE PARK

Without any blare of trumpets a magnificent public domain has been laid out on the west bank of the Hudson, from the Palisades to Bear Mountain. The cost was about $6,000,00, of which over half came from private subscriptions, and the balance from State funds. Among the citizens to whom the two states of New Jersey and New York are indebted for the furtherance of this great project, none stands higher than Mr. George W. Perkins, who has given unstintingly of time, effort and money to make this vast public improvement an assured success.

TO PROTECT WATER SUPPLY

The State of New York intends to dump into Mohansic Lake the sewage from the training school for boys at Yorktown Heights and the State Hospital at Yorktown. The waters of Mohansic Lake flow into Croton Lake, and thence are conducted to this town, where Lake, and thence are conducted to New York, where them daily. The City has protested against the contamination of its potable water supply.

TRADE OPENING IN FRANCE.

The department of trade and commerce at Ottawa, has been notified that from now until the third month after the war, the French Government has authorized a reduction in the duty on news print paper, wood, mechanical and chemical pulp of 95 per cent.

If sufficient ocean tonnage can be secured this opening should be of advantage to the Canadian paper mills.

THE FOOL AND OUR FOREST DOLLARS.

Goodbye to the fool with the empty gun;
Forgotten his bid for fame,
Though he kills his friend, it only counts one,
And that, nowadays, is tame.

The fool who playfully rocks the boat
Is on the front page no more,
He may rank high with the fools afloat
But his glory is gone ashore.

There's the fool with women, the fool with wine,
And the fool who games with the strangers,
And the poy-ride fool (he does well in his line
By combining these ancient dangers).

But they're all still down in the primer class,
Mere novices taking a flyer,
Compared with the prize-taking criminal ass,
The fool in the woods with fire.

A few hearts break for the deeds they've done
In their pitiful amateur way,
But fire slays dozens where they slay one,
And scourges a state in a day.

For the ruined home and the smokeless stack
And the worker unemployed
Know a hundred years shall never bring back
The things that his match destroyed.

E. T. ALLEN,
(Western Forestry and Conservative Association).

WRECKING NEWSPAPERS.

In Germany it is said that the war has put 1,200 newspapers out of business, and of these 200 suspended publications in one day, states the Davenport "Times." Several causes contributed to this. People everywhere had to go to war. That wrecked the newspaper organizations. Many of the subscribers had to go to war. That affected the subscription lists. People everywhere had to go to a new and much different economic basis. That curtailed the amount of money available for purchases of all kinds. The result was that advertising was reduced almost to the vanishing point. The newspapers that could find workers enough to keep them going had to struggle against slow death by starvation for lack of business. Only the large newspapers could afford to continue to struggle against the handicaps due to the war.

EASTERN PRESS ASSOCIATION.

The annual meeting of the Eastern Press Association, consisting of the publishers of all daily papers in the Maritime Provinces, was held at St. John, N.B., a few days ago.

Directors were elected as follows: Messrs. Blackadar, Ellis, McNeil, Keating, MacKinnon, Dennis and Black. At a subsequent meeting of these directors, Mr. Blackadar was chosen president, Mr. McNeil vice-president, and Mr. Pearson secretary-treasurer.

PATTON PAPER COMPANY BUYS LIMITS.

The Patton Paper Company of Appleton, Wisconsin, have purchased 25,000 acres of pulpwood lands in the Clay Belt from the Algoma Central Railway, and several timber cruisers representing the company are now in the Clay Belt along with Mr. D. C. A. Galarneau, chief forester of the railway.

LAURENTIDES WATER POWER.

Details of the agreement whereby the Shawinigan Company will take over the surplus water power of the Laurentide Company have been completed and the contract awaits only the signature of the interested parties. It is the intention to form a new company which will be called the Laurentide Pulp, Paper and Power Company, the latter using in the neighborhood of 25,000 horse power for the pulp and paper mills, and selling the remaining 100,000 horse power to Shawinigan at a price which, it is stated, will make Shawinigan almost as valuable as Laurentide itself.

NATIONAL PAPER CO. EXPANDS.

The National Paper Co. of Montreal, with mills at Valleyfield, are about to erect a building costing upwards of $100,000, for the manufacture of coated papers. They point out that the supply of coated paper from Germany has been cut off, and are preparing to supply the demand.

LOYAL PAPER MAKERS

How amazingly the call to arms has been answered in Scotland is illustrated by the record of the famous paper-making firm of Pirie and its employees. There were ten members of the family eligible to go to the front. Eleven are serving, one being long past service age. Of the office staff, thirty-seven were eligible, and sixteen are serving. Of the employees 180 were eligible and 140 are now with the colors, most of them in the Gordon Highlanders, recruited in Aberdeen and the adjacent region. Conscription would not greatly increase the supply of men from Scotland.—Toronto Globe.

BRITISH COLUMBIA TIMBER

Under the direction of the Minister of Lands of British Columbia, an attractive pamphlet entitled "British Columbia Timber" has been prepared for distribution among the buyers in overseas markets. It is intended to draw the attention of importers overseas to the forest products of the province, and especially to the facilities for exporting British Columbia lumber. Consisting of nearly forty pages, and containing nearly thirty illustrations, the pamphlet treats of the principal exportable woods, their qualities and uses, together with information concerning their strength values, and suitability for various uses.

THE WEEPING WILLOWS

The weeping willow, so-called (scientific name S. Babylinica), is a native of China, from which country it has been taken over most of the civilized earth.

AVIATOR TO DETECT FOREST FIRES.

An aviator has been employed in Wisconsin to detect and report on forest fires. L. A. Vilas, an aviator, is equipped with a powerful machine, which enables him to rise to a height of 1,000 feet in a few minutes. From this height he can survey some 200,000 acres of forest land. Any sign of fire is at once reported to the forest rangers. It is hoped by this means to prevent the outbreak of serious fires.

The Markets

CANADIAN MARKETS

The market for news print is a little better than it has been as the fall advertising campaign of a number of manufacturers and specialty firms has started. The regular issues of the dailies are somewhat larger than they have been for some months past. The demand, however, is not as good for news print as a year ago. Then, owing to the excitement occasioned by the war, many extras were issued, which added materially to the consumption. Extras are now rarely printed, and the story of the war is confined to regular editions, except when of special importance. Prices keep up well, and things are now settling down for fall. There is some doubt expressed as to whether there will be any decided revival in business this fall, but, in many lines of industry, there are indications that rock bottom has been touched, and a gradual betterment is looked for. All the mills are optimistically inclined. The color situation is growing more acute all the while, and all colored stock went up a quarter of a cent during the past few days.

In the book, writing, ledger and other kindred lines business is fair, and made up of smaller orders than usual, while runs are for the most part on limited quantities. Toilet, tissue and light wrapping paper mills are busy, and so are kraft plants. The jobbing trade report that business for September is considerably ahead of last year at this period. One house has increased its volume by ten per cent., and another by fifteen per cent. In fact, the wholesale trade appears to be in fine spirits over the good outlook for fall. Mills making specialties are also having a nice run of orders, and have no complaints to make.

In the sulphite pulp line, prices have gone up as has been predicted for some time. Norway and Sweden are shipping very little to America, and as for their sulphur and coal supply, they are in a rather bad way. The dock supplies from Scandinavia are now very low, it being reported that there are not more than fifteen thousand tons on the Atlantic seaboard. Germany has taken the duty off pulp, and that country is being furnished by Scandinavia. Paper manufacturers are now beginning to realize the seriousness of the situation, and are making earnest inquiries.

In the ground wood area, not much is doing except on contract. There are more inquiries now that fall is here. Water conditions are reported good except in certain parts of Quebec. So many news print mills across the border have been enabled to grind their own pulp, and even to store up a supply that will last them for some weeks, that no immediate decided change is looked for. Prices keep up well. The export of wood pulp to the United States has fallen off considerably. The shipments to England are increasing, 110,331 tons were sent across the water from Canada in 1914, which was a decided advance on the total of the years previous.

Mills, which are making glassine and greaseproof to replace the foreign papers of this kind imported before the war, are doing splendidly, shipments being made to foreign countries which augurs well for the success of the venture.

Regarding the rag and paper stock market, matters are still unsettled, but buying of paper stock is growing more general, and the tendency is to store up sufficient stock to meet the improved business, which is expected to come. There is a better demand for clean mixed papers and bagging and roofing stock are in quite active requisition.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.90 to $1.95 at mill, in carload lots.
News (sheets), $1.95 to $2.05 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite (unbleached), $40 to $44, del. in Canada.
Sulphite (unbleached), $40 to $46, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, 85c.
No. 2 book stock, 40c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.20.
No. 1 print Manilas, 75c.
Folded News, 35c.
Over issues, 45c.
No. 1 cleaned mixed paper, 32½c.
Old white cotton, $2.12½.
No. 1 white shirt cuttings, $4.50.
Black overall cuttings, $1.50.
Thirds, blues, $1.25.
Black linings, $1.50.
New light flannelettes, $4.25.
Ordinary satinets, $1.05.
Flock, $1.15.
Tailor rags, .95c.
Blue overall cuttings, $3.37½.
Manila rope, 2½.
N. 1 burlap bagging, $1.10.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKETS.

New York, September 29, 1915.

Time makes but little impression on ground wood pulp. There has been no real demand for stock in this market for several months, and it hardly seems that these conditions will be in any way alleviated for any period in the near future. Grinders blame the unusually good water supplies for this time of the year throughout New York State for the present state of the market. By reason of the good water supplies the newsprint manufacturers have been able to operate their grinding machines steadily, and have, therefore, been able to accumulate considerable stock, which is being set aside for future use. Business with the grinders has been poor, as would naturally be expected when such conditions, as those mentioned, exist. As a result, many of them are using large quantities of their wood for other uses than the making of pulp. The foreign inquiry is strong, and is said to be increasing in proportions, but the facilities which are necessary to take care of this business are almost impossible to be obtained. Hence, comparatively little has materialized in this direction.

Further advances in the chemical pulp markets have been witnessed during the past few weeks, and it is probable that activities will continue upward. Considerable consternation has been caused among many of the paper manufacturers by foreign advices, which intimate that a shortage of pulp is likely for the coming year. A number of those mill owners, who have up to this time practically disregarded the growing acuteness of conditions in this market, are now inquiring from all possible sources and are putting forth every effort to cover themselves for stock for the coming year. However, it has not been a simple matter to arrange for these supplies. While the mills are offering to pay much more than they were willing to pay some time ago, they are still somewhat behind the increasing demands of the foreign pulp makers. Importers state that only limited quantities of pulp can be secured on new contracts. In these cases no guarantees are given for shipment. It is the general belief that prices will still go higher. Dealers have been considering a prediction made by a concern in England, during the past ten days or so, namely, that strong sulphite would be selling for 3c. before the first of the year. While all hope that such an acute stage will not be reached, it is admitted that such a feat would not be impossible. Complaints are still being received from the Scandinavian mills on the score of the very high prices which they are compelled to pay for the various raw materials which are used in the making of the chemical pulps. Coal is in great need. Large quantities are being shipped from the United States, at a big cost, but facilities cannot be secured to ship enough to meet all of the needs. Some of the mills are using coal which is imported from Germany, but this is of an inferior quality. Sulphur is being exported from this country to Norway and Sweden with great difficulty, owing to the fact that it is contraband of war. There is also somewhat of a shortage of rosin. Bleached sulphite seems to be strongly affected because of a decided scarcity of bleaching powder. This was formerly secured from England. But as Great Britain is using her bleaching powder in the manufacture of explosives, this demand has reverted to the United States. Due to an advance in the bleaching powder market and to the fact that it has not been possible to supply the foreign mills with sufficient of this stock, several bleached sulphite manufacturers have declared that it may be necessary for them to discontinue operating. Krafts and sulphates are both in good demand, with but little supply on hand.

Marked changes are expected in the various kinds of rag stock. At present, the market is gradually taking on more strength and prices are slowly ascending. The cause for this is a realization on the part of the packers and dealers that there is existing in this country an actual scarcity of stock. It is known that the collections in the United States are far from being sufficient to take care of the needs of the consumers, and that it has always been the province of the foreign rags to make up the deficit in domestic stock. But, now the prospects of getting foreign rags are growing dimmer and dimmer. Imports have been dwindling continually and stocks on hand have been getting lower and lower, so that there can not be very much of a reserve supply available. From abroad, reports are very discouraging. Collections are small and only for local uses. Linens and new cuttings are being gathered by the various belligerent governments for use in the issuance of currency and bond certificates. With

such conditions existing, dealers cannot see how a big jump in the market can be avoided when a demand of any kind is made for stock. Signs of improvement have been detected. Thus far, activities have been confined mostly to the dealers and packers who have been buying up all of the stock which they have found available. Bagging has been gaining remarkably in momentum in its upward flight. A good demand for most of these grades from outside of the paper trade has helped to advance prices. Aside from this, there is far from an abundance of bagging to be had. Gunny bagging, domestic stock, is selling at 1.80c to 2.00c, while the foreign stock is being quoted at 1.90c to 2.12½c. Bright bagging is going at 1.50c to 1.75c, sound bagging can be had for 1.30c to 1.35c and mixed bagging is obtainable at 1.05c to 1.15c. Manila rope is in good demand and is being quoted at 2.90c to 3.00c. The movement of waste papers has improved greatly during the past few weeks. The continued activity of the board mills has helped this market and has been instrumental in aiding prices in re-ascending to their normal levels. Mixed papers are brisk and are being sold at 30c. to 35c. Strictly over-issue news is selling at about 50c. to 55c., and strictly folded news is fairly active at 35c. to 40¾c. Manilas are in satisfactory demand, and have improved generally in prices. Flat stock and shavings are acting in sympathy with the other grades.

The general paper market has taken on a good deal of color within the past few weeks. The end of the vacation season has brought with it a renewal of activities, which has made a perceptible increase in the volume of business. Most grades have been getting firmer, and some have even advanced in price. The tendency of the market as a whole is to ascend. Just now, the sulphite situation is reflecting very strongly on most kinds of paper, and it seems that several further advances are to be recorded in the very near future. Reports on newsprint show that quotations are more satisfactory to the mills than they have been in some time. It is believed that the Canadian manufacturers will profit considerably from the recent selling arrangements through which the largest part of export into the United States will be handled by two domestic agents. Advices from Watertown state that while the strike is still effective, most of the machines in the mills concerned are being operated by strike-breakers. While business in tissues has not changed materially, there have been movements on the part of the mills to advance prices a little on the ground of the advancing sulphite market. Little shading of prices is now being practised and there are prospects of a fairly lively market within a month or so. At present, pure white tissues are not very active. Manila tissues, however, are in good demand. A decided advance has been recorded in manila wrappings of both the cheaper and more expensive grades. Reports from the mills making these goods state that they are pretty nearly all running to capacity with orders a few weeks ahead. Butchers' fibres, too, have gone up, and are now in good demand at advanced prices. Krafts continue quiet and to a great degree, inactive. Book papers are in better demand, and there is a tendency for better quotations to rule. Most of the mills are operating at a good capacity. Boards have improved materially. The past few months in this market have shown a steady upward movement. Paper bags are a little stronger and are likely to advance because of the higher level which has been reached by bag papers.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.90c to 2.25c., delivered.
Bleached Sulphite, domestic, 2.80c to 3c., delivered.
Bleached Sulphite, impt., 2.70c to 3.15c., ex-dock, N.Y.
Easy Bleaching, impt., 2.25c to 2.45c. ex-dock, N.Y.
Unbleached Sulphate, impt., 1.85c to 2.05c., ex-dock, N.Y.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 1.95c to 2.00c.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $24 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $22 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

BOSTON HERALD SOLD.

The property of the Boston Herald, Incorporated, was sold at public sale last week by the Commonwealth Trust Company of Boston to F. DeC. Sullivan of New York, the representative of Morton F. Plant and certain other holders of securities of the Boston Herald, Incorporated, for $1,800,000, one of the largest figures at which a newspaper has ever been moved in Boston.

Mr. Sullivan acquired the property for the Boston Publishing Company, a Massachusetts corporation organized by him and his associates. The officers of the Boston Publishing Co., elected immediately after the sale was ratified are: Robert L. O'Brien, president; F. De C. Sullivan, vice-president; James H. Higgins, treasurer and general manager, and Thomas W. Streeter, clerk. Messrs. O'Brien, Sullivan and Higgins constitute the new board of directors.

RETURNS TO MINISTRY.

In order to return to the ministry James A. Orrock has sold the Dodgeville (Wis.) Sun Republic.

This is a somewhat unusual proceeding as few editors have sufficient religion left in them after a few years struggle with printer's devils and proof readers to get a job of any kind in a church; even that of taking up the collection.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

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VOL. XIII. **MONTREAL, OCTOBER 15, 1915** **No. 20**

Honoring Our Dead

The movement to plant maple seeds on the graves of Canadians who died in France and Flanders is most worthy and patriotic. The Land of the Maple is 3,000 miles from the battle scarred fields of France and Flanders, but the sons of Canada did not hesitate to go that distance and give up their lives in the hope of putting an end to Prussian militarism. They would not have gone unless they had been truly patriotic. The ideals of democracy and liberty which they imbibed in Canada meant more to them than life itself.

The least that Canada can do is to honor her heroic dead and to see that their dependents shall not suffer. The movement to plant young maples on the blood stained fields made historic through the bravery of our soldiers should appeal to all Canadians. In the years to come when our children visit those far off fields the maple trees blooming over the graves of our honored dead will recall the sacrifice made on behalf of freedom.

Wood Pulp vs. Cotton

The announcement that Germany is substituting wood pulp for cotton in the manufacture of explosives still continues to excite the interest of chemists, paper makers and munition manufacturers.

The Paper Maker, a British Trade Journal, has collected the opinions of a number of experts upon the subject, but these differ somewhat widely in their viewpoints, so that it is impossible to arrive at any satisfactory conclusion. It is another case of "when doctors disagree."

It appears that cellulose made from purified wood pulp yields on nitration a nitro-cellulose in every respect equal to that made from cotton. The weight of opinion among the experts in the United Kingdom inclines to the belief that Germany and Austria can obtain from their forests sufficient wood pulp for all their requirements for munitions for several years to come. Apart from their own supplies, the Germans can import from Scandinavian countries, which are the chief exporters of wood pulp. There has arisen some difference of opinion as to whether the present arms are suitable for explosives with a wood pulp basis.

The following are some of the viewpoints expressed by the authorities consulted by the Paper Maker—

Sir William Ramsay says: "I quite agree that it is highly probable that the Germans are making nitro-lignosef rom wood fibre. This is the tragedy of our always being too late. I quite agree that we should declare wood pulp contraband, but I hesitate to start another contraband; it takes too much time and energy.

"The Germans have plenty of wood, their country is largely afforested. As to the relative efficacy of wood-pulp and cotton, I am not expert enough to answer that. All that I can say is that I am told by French experts that the ballistic power of nitro-lignose is not equal to that of gun cotton. But Krupp is turning out any number of guns of all sorts, and doubtless they are standardized as regards sights and chambers for litro-lignose."

Another expert, Walter F. Reid, sees no value in de-

claring wood pulp contraband. for "Germany has such large areas of forests containing suitable wood that [illegible] consumption of explosives could be maintained for years without importation of wood pulp." He adds that one of the most popular of [illegible] has been made of wood pulp for [illegible] than thirty [illegible]

[illegible] holds a rather dif- [illegible] man pulp mills could not produce a product that would reach the requirements [illegible] adding. "to suddenly drop cot- [illegible] at any rate. it would be a most serious handicap. [illegible]"

[illegible] no doubt but that the Germans are a re- [illegible] ful people. and it would not be at all surprising [illegible] which in a measure would take the place of cotton. It is a certainty. however. that wood pulp con- [illegible] many more impurities than cotton. while its [illegible] undoubtedly are disadvantages. but "beggars cannot be choosers." and the Germans are forced to make the best possible use of the material they have at hand. To Canadian pulp and paper men it looks as if a new field had been found for wood pulp. In addi- [illegible] the manufacture of explosi[illegible]

Government Co-operation

[illegible] results are being obtained by the [illegible] government in its efforts to assist in [illegible] country. but is not unknown in Europe. In Germany [illegible] was always an important factor in [illegible] Foreign countries. As a matter of fact [illegible]

[illegible] and again this year the Federal Gov- [illegible] Government is doing all in [illegible]

[illegible] length. this might become a [illegible] ernments. and lose their initiative. To a certain extent. it is a wise move and we would like to see a closer co-operation between all the provincial governments and the various industries peculiar to those provinces.

Safety First Pays

[illegible] garded some years ago as more or less of a hobby by unduly careful employers of labor. has developed into an international movement. It has long since passed the experimental stage and today employers of labor. heads of great corporations as well [illegible] movement as one of the most beneficial and advan- [illegible] man.

The movement was first inaugurated by certain railroad companies in the United States who tried to impress upon their employees the inadvisability of tak- [illegible] sure than sorry" or in other words that a few precautions taken repaid both the indiviudual and the company. From the railroads it spread to all kinds of industrial corporations until today there is hardly an employer or employee on the continent who has not [illegible] movement.

In addition to urging men to take necessary precautions. the movement has to do with the utilization of safe guards in connection with machinery. better factory appliances and in brief. a larger and fuller consideration of the rights of both employer and employee. It has meant that machinery which might prove danger- out to workmen has been covered up or fenced off in such a way as to reduce the dangers of accident to a minimum. It has means better factory laws. more consideration for the health and the conditions under which the employes work. On the other hand it has [illegible] the liability to employers by impressing upon [illegible] concerned.

Pulp and Paper men have not been slow to take ad- [illegible] is found in a paper mill. there is the likelihood of many [illegible] nts. but these have been greatly reduced as a result of the agitation of eliminating danger. "Safety First" from being the propaganda of a visionary altruist has become one of the greatest economic and in- [illegible] of the age.

The highest paid writer in the world on a per word [illegible] blazoned forth at railroad crossings. The payment of

thousands of dollars for this warning was a profitable investment. "Safety First" under all circumstances pays.

Publicity as a Cure

The Canadian Forestry Association is carrying on an excellent work in connection with their publicity bureau. This was commenced some four or five months ago and has for its object the distribution of information on forest affairs and the better protection of forests from fire.

Since the work has started a number of forest protective associations such as the Lower Ottawa and the St. Maurice have co-operated with the Canadian Forestry Association by publishing news items broadcast regarding the prosecution of settlers who have caused forest fires. The publicity given these offenders is having a wholesome effect. An individual may commit arson and impunity so long as he is not found out, but no one desires to get his name in the papers and to be heralded forth as an offender against the laws of the land. The Association is doing an excellent work, as anything which will tend to lessen forest fires is deserving of the widest support.

Forest Fires

Elsewhere in this issue appears a cut and a short descriptive article of an observation or look out tower for the purpose of detecting forest fires. In our last issue we published a note telling of the efforts being made in Wisconsin to detect fires. There a hydro-aeroplane has been brought into use and sails over the forests keeping a sharp look out for incipient blazes.

It has been well said that all fires are the same size at the beginning. If a fire can be detected in its early stages it is easily put out. If allowed to go unchecked it may cause millions of dollars damage.

It is estimated that the amount of timber destroyed by fire in Canada is several times as great as the amount which has been cut up to comparatively recent date. In the neighboring republic fire has destroyed at least as much timber as has been utilized in lumbering operations. It is estimated that the total amount of standing timber in the United States amounts to 2,200 billion board feet of which 76 per cent is privately owned, about 21 per cent is in national forests and the remainder is partly in other forms of public control. In the timber operations commenced in the United States that country possesses 1,200 billion feet but this does not include pulp wood. Fires have done irreparable damage to our forests, but it is encouraging to note the measures are being taken for the prevention and detection of forest fires. Let the good work continue.

Look-out Tower, Devil Mountain, Que.

Look-out tower on the summit of Devil mountain, Quebec. This tower was constructed by the Lower Ottawa Forest Protective Association, which maintains a gatekeeper at this point throughout the fire season. During the dry weather this gatekeeper is constantly on the lookout for forest fires.

Telephone communication ensures the prompt despatch of necessary men and supplies in case a fire is discovered anywhere in the surrounding country. This tower is located on the summit of the divide between the Gatineau and Lievre watersheds, and affords a

magnificent view of the country for many miles in all directions. An example of the efficiency of this arrangement was demonstrated recently, when a forest fire was located by the watchman at a distance of thirty miles. The use of the telephone permitted the fire being reported to the ranger concerned within a very few minutes. In many parts of Canada the efficiency of forest protective work is being greatly increased through the construction of look-out towers, telephones and trails. Such improvements are greatly facilitated wherever there is co-operation between timber holders, as in the case of the Lower Ottawa and St. Maurice Forest Protective Associations.

SHORTAGE OF "NEWSPRINT."

Several English newspapers are calling attention to the fact that owing to the growing scarcity of paper it is very important that their returns should be reduced to the lowest minimum and requesting that their distributing agents should weed their daily orders with this purpose in view.

These circumstances, which have been brought about by the present shipping situation, among one of the most should be of interest to the Canadian mills.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON—Killed in Action, Feb. 28th, 1915.
WM. SMITH.
WM. DONOHUE.
Corp. EARL J. WILSON.—Recommended for D.S.M.; severely wounded at St. Julien.
GEO. ALBERT BROWN.
C. V. PERRY.
Sergt.-Major E. C. MORRIS.
SAPPER L. A. SWEEZEY, Queen's University Field Engineers.
JAMES BEGGS, 11th Battalion Royal Irish Rifles.

Bird and Son.

JAMES BOATH.
WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

Lieut. H. A. REIFFENSTEIN.

Campbell Lumber Company, Limited.

COLIN G. B. CAMPBELL.
THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GILDDEN CAMPBELL,

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford and Company.

SYDNEY LAMPLOUGH.
HARRY HENSHALL.
ERIC FORD.
W. D. FORD.
THOS. B. FORD,

Kinleith Paper Company, Limited.

Capt. C. STEWART-PATTERSON.
GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

Canada Paper Company.

Lieut. F. C. H. TYRON.

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Robt. Brown, John Green, H. Brown and Malcolm Macdonald, 12th Batt., 4th Brigade, all Laurentide employes.

Jack Pullen, Mechanical Transport. Previous to enlistment was in Const. Dept. Laurentide Co.

Harry Rathbone, of 9th Am. Col. of Laurentide Sulphite Mill.

Part of 23rd Battalion. Two Laurentide employes, Tom Allison and Fred Hodges, are in group.

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Capt. James Stanley Scott, former employe Engineering Dept., Laurentide Co.

PULP TESTS FOR MOISTURE

By D. V. McSWEENEY.

In questions of buying and selling pulp cannot be classed with other material, bought and sold on the market. If a manufacturer sells to a smaller house a web of cloth, and upon its arrival the web is found to be 50 yards short, the manufacturer is notified, the error is found by checking up, and both parties are satisfied, neither being "out" any money on the transaction.

The buying and selling of pulp is a more complicated matter. Pulp contains water or moisture, and it is the determining the amount of same, that gives rise to disputes between the two parties. Cars are delayed being unloaded, to be tested by a neutral party, customers are often lost, seldom to be regained, and the one fact, that each party considers itself to be in the right, leads one to believe that the testing of pulp is one of the most important factors about a mill.

The pulp tested at a mill, holds an important position. The pay clerk pays the laborer for service rendered, no more or less. The tester tests the pulp shipped or received, or in other words, he informs the sales department, or the purchasing department the amount shipped or received. His figures are final, as in many cases there is no opportunity to "check up" same, as the car has been shipped to its destination, or in case of pulp received—it may be converted into paper at the time the "test" dispute arises. For this reason the tests should be accurate.

A difference of 1 per cent or 2 per cent amounts to a large item at the end of the month, the amount depending on the quantity of pulp delivered or received.

For an individual with good judgment, it is a simple matter to test pulp accurately. Oftentimes too much is expected of the tester. In many plants he acts as shipper, time clerk, etc., having many other duties to attend to. As a result of this, there are times when some duty is to be neglected, and the easiest job to neglect is the "testing of pulp." If the pulp has been testing approximately 42 per cent a day for a few days, he sees no reason why he cannot bill out the car (just loaded) at that figure. Perhaps if the samples, which he has discarded, were tested, the test might be 40 per cent or 44 per cent. Should a dispute arise over the test of the same car later on, and the tester being asked for an explanation, he simply declares the test was accurate, and can show other cars loaded at the same date, where the test is, or was, approximately the same. However, this explanation is no proof that the test of the car in question was accurate.

The Necessity of Testing.

No mill is too large and none too small, but what a proper arrangement should be made to have the finished product tested accurately. This is necessary for several reasons.

1st.—After the wood has been cut, skidded, driven down the rivers, cut up, barked, cooked or ground into pulp, and after having gone through the many operations before becoming pulp, it should be considered a very important duty to see that a mill receives credit for every pound of pulp made.

2nd.—A shipper, whose tests are always found accurate, eventually becomes the one with whom the buyer wishes to deal, a good name acting as an asset.

3rd.—Incorrect tests are oftentimes the cause of large shortages of pulp, when the same is stored or piled. When pulp is piled or stored, and afterwards shipped, there often occurs large shortages. The reason given when a pile runs many tons short is that the loss in handling has been from 3 to 5 per cent. In other words, this 5 per cent loss in handling means that for every 100 tons piled, 5 tons are lost by particles falling off or becoming separated from the laps or bales during the piling and shipping. If proper tests are taken the loss is(and should be too small an item to mention. Either incorrect tests are taken when the pulp is being shipped, or the test was marked too high, when the pulp was being stored, giving the mill the benefit of a high production and a good yield for each cord of wood consumed.

Proper Instrusctions for Testing.

The clerk whose duty it is to test the pulp, should receive proper instructions. Without instructions he may fall in line with some method of his own, which may be entirely wrong. The shipper or buyer may be the loser by many thousands of dollars every year by improper methods. Instructions as to the size of the samples the intervals of cutting, the time of drying, etc., should be followed by the clerk. If the proper instructions are given and followed to the letter, the trouble so often occasioned by "tests" will be a thing of the past.

Mills Destitute of Ovens.

All mills should test purchased pulp, or pulp that is transferred from other mills of the same company. We find at one plant where but a carload of sulphite screenings are used occasionally, proper tests are taken. At another plant where large quantities are used, nearly all being purchased, no samples are cut or tested. Many mills are without drying ovens, and if pulp is to be tested, the samples are cut at random, weighed inaccurately, and left to dry either on the top of a boiler or pinned to the office wall, where they are left until they are supposed to be air dry. Nothing should be neglected in obtaining an up-to-date drying oven, as very few companies wish to be compensated for pulp which they do not actually deliver, and no concern cares to give, free gratis, pulp which they have manufactured.

One does not have to be a chemist or technical scholar to test pulp properly. They may perform the operation more thoroughly than many a mill clerk, who has a large variety of work, but all that is required is good judgment and the proper amount of common sense. Customers do not "kick" on variations less than 1 per cent. It is the large differences that they object to, and these large variations can and should be avoided.

Following are suggestions that are thought by the writer, will solve many of the difficulties which are so frequently met with in the testing of pulp to determine the percentage of air dry fibre.

The Cutting of Samples.

In cutting samples for tests, great care and no little skill should be exercised in order to secure fair, representative samples. When samples are cut for sulphite or groundwood direct from the wet machines, it should be borne in mind that the wooden press rolls contain many imperfections, which cause the test to vary from high to low. The test for samples taken from the two different ends of the roll will vary considerably if the roll is not screwed down evenly, or if either end of the roll has cracks or splinters, are broken off. From a roll, one end of which was in perfect condition, but from the other end, large splinters broken off, etc., a test was taken with the following result: Air dry test, from the end in perfect condition 42.61% Air dry test, from the end in poor condition 40.10

Difference 2.51%

For this reason, if for no other, the sample should be cut the entire width of the roll, taking in the sloppy edges. The sample should be at least two inches in width. Samples should be cut at regular intervals as there are times when the consistency of the stock will vary. When for any reason the stock is running thin, it takes a longer time for the sheet to form on the roll, before it is cut off. The sheet undergoes more pressure, and the suction has more effect on same. The result is that the test is higher than when the stock is running heavy.

One mill was having trouble with the tests being too high. The weigher cut the samples for tests. It was also his duty to pull the trucks from the wet machines to the scales, weigh same and see that the pulp was put in the proper cars. The samples were cut the entire width of the roll, samples were sealed immediately and every operation thoroughly performed. Still the tests were unusually high. The difficulty lay in the fact, that when the stock was running very heavy, he was so busy, that he did not have time to cut samples. When the stock was running light, he did have the time, and it was then that the samples were cut. This reason alone, caused the tests to be high.

The same appears to be the case with sulphite, dried on machines. The variation is greater, having been known to vary from 70 per cent to 95 per cent. With the same amount of steam in the dryers, if the stock is very thin, the sheet is very light, and is thoroughly dried, where if the sheet is very heavy, the test is many points lower. Tests should be cut very often, and when rolls are taken from cars at the destination, too many rolls cannot be tested. At times the centre of the roll will be the dampest, and again it may be the driest part of the roll. Too many samples cannot be taken. If too large an amount is taken for the size of the oven, they should be mixed thoroughly, and the faulty sample cast aside. Mix again and cast the faulty aside, etc., and so on until the proper amount is left for the test.

For ground wood, but more so, for sulphite, the sample should be cut the entire thickness of the lap. The felt side testing a little higher than the roll side. A series of tests for sulphite pulp gave the following results:

Air dry per cent felt side only 41.91%
Air dry per cent roll side only 40.21%

The difference is .. .. 1.7 %
which, divided by 2, gives a difference of 85-100 of 1%

When pulp is pressed with the modern hydraulic press, with from 600 to 800 tons pressure on the ram, the cutting of samples is more complex. More samples must be taken to insure a fair test, especially in cases where the mill presses, the total production as same is made. This is necessary for many reasons. The time of pressure is bound to vary, causing the test of the different loads to vary. In addition to this, there are times when the presses are down for repairs, and a less number of presses have to press the same amount of pulp.

With the ordinary hydraulic press, there are two kinds of pressure—the low and the high. After the truck load of pulp is placed under the press, the low pressure is applied, acting slowly, so as to keep the pulp compact and prevent crumbling. The laps of pulp are separated by wire matts, cocoa matting or canvas. After the low pressure has been on for several minutes, the water begins to splash or free itself from the pulp, coming from all sides.

The high pressure is then applied and the longer the time it is on, the higher the test of the pulp, as more water has been freed from the pulp. However, unless the pressing is performed in a systematic manner

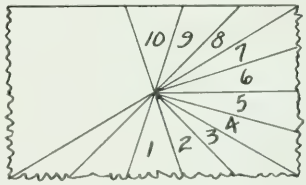

Fig. 1.

and the time of pressure does not vary, the different truckloads will contain pulp which will vary in test.

One truckload may test 55 per cent, another 63 per percent, another may test 58 per cent, and so on. As above stated, when a mill presses the entire production, it is only natural that the test should vary considerably. For example, if a mill is producing 150 tons per day, and the same is pressed at an average of 30 minutes, should the production be raised to 170 tons, then the time of pressure is lessened, and the test will be lower. It is thus readily seen that many samples should be taken from pulp pressed by hydraulic presses. The sample should be wedge shaped, with the apex at the centre. When the water is pressed from the pulp, it works its way to the edge of the laps, from which it falls to the sewer, leaving the edges of the pulp very wet. The centre of the lap is the dryest, and the moisture increases as the edge is reached. Each sample should be taken at a different place of the lap, as shown by Figure No. 1. Two laps of pulp are placed between each mat. When the pulp is pressed, the two laps are joined together, but are easily separated. Three edges contain sloppy pulp, the faulty edge being as dry as any portion of the lap. For this reason the samples should be cut in different places.

Below, are some figures showing the length of time the high and low pressure was applied at a mill where the presses were not "timed." It can be seen that the time varied, and no two truckloads would test alike. In many cases the low pressure has been on too long, and the high pressure time has been shortened. If the pulp taken from the first truck (which has had 27 minutes in the press) tested 59.98 per cent, then it

is only a reasonable deduction that the pulp from the truck No. 5 (which has been pressed but 18 minutes), the test should be less, as it was in this case, 57.70 per cent.

Truck No.	Low.	High.	Total.	Test.
1	12 min.	15	27	59.98
2	12 min.	15	25	59.30
3	9 min.	10	19	58.13
4	10 min.	20	30	60.10
5	14 min.	4	18	57.70
6	15 min.	10	25	59.40
7	25 min.	10	35	59.30
8	12 min.	7	19	57.76

At all mills having hydraulic presses, it is the custom to "time" each load which is pressed. Near each press is a "dummy" clock. When the operator puts a truck of pulp under the press, he sets the clock at a point 10 or 12 minutes ahead. When this time is up, or the actual 10 or 12 minutes has passed (by a real clock or watch) he takes off the low pressure and puts on the high. The high pressure is the one that does the actual pressing. The load is then left under the press a certain length of time, or until another truckload (which has been built up from the wet machines), is ready.

After the time system was in augurated at the mill (from which the above tests were taken) the time of pressure for the low and the high became more steady,

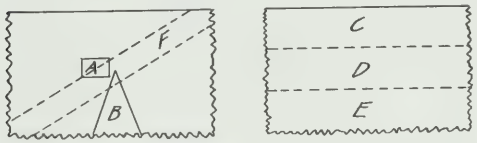

Fig. 2.

and the tests for the different loads more uniform, as can be seen from the figures. In addition to the wedge shaped sample, there are many other methods for cutting samples from hydraulic pressed pulp. Every mill has a method of its own. Mills have been slow in adopting a standard method, and it may be for this reason that buyers and sellers sometimes disagree on pulp tests.

Low.	High.	Total.	Test.
10	15	25	59.90
9	14	23	59.60
11	11	22	58.87
11	15	26	59.30
8	16	24	58.99

In showing the many methods of cutting samples from hydraulic pressed pulp, in some cases it will be noted that the variation in test is considerable. The ragged lines denote the three sides of the lap, which is sloppy, the straight line, representing the edge, which is dry.

Sample A—Inside the lap . . . . . 57.4 %
Sample B—The wedge . . . . . 55.9 %
Sample C—Inside the lap 57.24%
Sample D—Centre of lap 56.66%
Sample E—Outside of lap 55.01%
Sample F—Cut diagonally 56.02%

When the high pressure is released the pulp on the truck swells a little as the ram rises, and the slight suction causes the top and bottom lap to test lower than the other laps in the truck, but the variation is very small, being less than ½ of 1 per cent.

Sealing of Samples.

When the samples are cut, they are not to be set in a place where they will lose moisture. They should be placed in an air tight can or jar, from which no moisture will escape. It often occurs, that after the samples are cut, they are placed "anywhere" until the tester finds time to weight the same. They dry out to a certain extent, the moisture escaping, depending upon the length of time exposed. Too much stress cannot be laid on this point, for if the samples (being cut properly) are guarded until they are weighed, very little trouble will be experienced with the tests. Samples placed in cans or jars will lose a little moisture, as at certain temperatures the moisture leaves the samples and forms on the side of the jar. The most accurate method is to have the weight of the can or jar recorded, weigh both can and pulp and deduct the weight of the can. Many plants which manufacture wet pulp (from wet machines) have the practice of opening a lap of pulp and placing the samples inside, until they are ready to be weighed. There is no objection to this practice, unless the same lap is used too long, it becoming too dry. During warm weather, when samples lie exposed for many hours, for example, from Saturday night until Monday morning, it is noticeable that the test runs high, and is inaccurate. Arrangements should be made to have the samples weighed, when the mill shuts down, and not allow the samples to dry out before weighing.

Weighing of Samples.

After the samples are cut, the best practice is to weigh same immediately. Scales giving readings from 1-10 to 1-20 of an ounce are accurate enough for the weighing of pulp samples. When weighing samples, all accumulation of loose or ragged pulp should be removed as the particles are liable to be separated from the samples, and not reweighed when the same are bone dry. Care should be taken that the scales are properly balanced before weighing, and that the correct reading on the scale beam is taken .

The Drying Oven.

The oven should be fitted with a thermometer. There should be an aperature at the top, to allow the vapor to pass off from the drying pulp. The oven should be built in sections, so that samples can be put in at any time, without interfering with the samples already drying. If a wet lot of samples are put in the oven only a few hours before another lot are to be taken out, the test of the latter lot, will be incorrect, as the samples have absorbed moisture, from the set of samples just put in. Stand the samples upright, and never crowd them in the oven.

The Time of Drying.

The time of drying depends wholly upon how the samples are treated. Pulp laps from wet machines will vary from ¼ inch to 7-16 inch. Laps of pulp pressed by hydraulic presses may average 1¼ inches in thickness. If the samples are left in such condition it will take the full 24 hours to dry same. Laps are formed by the upper roll taking from the felt a thin sheet of pulp at each revolution. All samples can be separated easily without losing any fibre in doing so. The quickest method of drying samples is to separate the same as much as possible, place same standing upright in the oven, and allow them to dry with the proper temperature of from 212 deg. to 220 deg. F. After

the samples have been in the oven for 5 hours, take them out and weigh, provided, of course, that they feel bone dry. After weighing the same, place back in the oven for another hour and a half, remove, and weigh again. Should there be no difference in the weight, then it may be taken that same are bone dry. By cracking samples with the hands, one familiar with testing, can easily tell if samples are bone dry or not. If the samples are scorched or burnt, the test will be low. When pulp is burnt to any extent, the colour changes and by tearing or cracking samples, the fibre is destroyed. As nearly all material loses weight on burning, it should be borne in mind that pulp is no exception to the rule.

Weighing After Drying.

The samples should be weighed as soon as possible. By having the scales near the oven, no moisture is absorbed from the air, but by having the oven in one room and the scales in another, time is lost in travelling from the oven to the scales, the samples are liable to be air dry, instead of bone dry, by the time the scales are reached. Oftentimes, while one set of samples are being removed from the oven, the door or doors are left open, and the temperature of the oven, instead of being heated to a high temperature, becomes as cool as the surrounding air. Samples absorb moisture quickly, and become partly air dry. The true method of estimating the amount of pulp should be the bone dry percentage, but it makes no difference as long as one method is used. The 10 per cent added to the bone dry percentage does not always represent the amount of moisture absorbed. The amount depends upon the condition of the atmosphere, varying perhaps from 8 per cent to 17 per cent. By the 10 per cent method, 1-10th of the bone dry percentage is added to itself. By the 9 per cent method the bone dry percentage is multiplied by 100 and divided by 90. Should the bone dry percentage for a set of samples be 37.1 per cent, by the 10 per cent method, the air dry percentage will be 40.81 per cent, and by the 9 per cent method it will be 41.22 per cent. One method should be universally adoptd.

Test Slips or Forms.

All mills should have proper "test slips" or forms. If properly filled out by the tester, proper explanations can be given for the variations in tests. In the case of pulp shipped, a considerable length of time elapses before the car reaches its destination, and if there is a complaint on the test, the conditions at the time of shipping are forgotten. Very few reasonable explanations can be given. Below is a form that the writer thinks will prove of interest.

Date ..... Car No. ..... Hours loaded .....
Amount from storage .... From machines ....
Wet weight .... Bone dry weight .... Bone dry percentage ..... Air dry percentage .....
Capacity of car ..... No. samples taken .....
Hour put in oven ..... Hour taken out .....
Temperature ..... Remarks .....
.....
.....
.....

Following the line "remarks," the conditions at the time of loading cars should be recorded. It might read "suction pulp down two hours while loading," "stock running very heavy," caused by a soft cook or by all stones ust having been jigged, or it might read "stock running light," caused by a cook being on the "raw side," or by making a "fine" grade of ground wood.

In one case, the test should be lower than usual, and in the latter case the test should be higher. It should be born in mind that there are many reasons for variations in tests. If there were not, then there would be no necessity of testing pulp daily. One test for a week or a month would suffice.

The Cornish China Clay Trade

(Special to Pulp and Paper Magazine.)

I sent you by the SS. Hesperian a review on the Cornish china clay trade, upon which very important restrictions have just been imposed, but, unfortunately, as your readers are fully aware, this boat was torpedoed and all the mails lost, consequently I am sending you another. There has been quite an activity in the trade for several weeks past, and at Fowey, the principal port, the shipping has been exceedingly busy. I happened to see Mr. T. Medland Stocker, J.P., the chairman and one of the managing directors of the West of England and Great Beam China Clay Company, for a few moments at Par Station a few days ago, and with regard to the present situation, he said that they were maintaining a fair amount of trade, but it was chiefly for the American and Canadian markets, and they were depleting some of their large stocks on hand. August and September have been always regarded as the best markets for the year. Mr. Stocker, who was wearing his insignia as Recruiting Officer, was on his way to London, and he informed me that recruiting amongst the clay-workers was going on very satisfactory, and he had succeeded in securing over 600 enlistments for the various sections of military work, but more particularly for the labour section in munition works.

An official notice prohibiting the general export of china clay except to British Possessions and Protectorates, was issued from the London Customs House on Friday, August 28, but it did not reach Cornwall before some days afterward. It is stated that shipments would be allowed under licenses granted on the recommendation of a War Trade Department. So far the new order has had no material effect upon Fowey, and many cargoes entered at the Customs House before the prohibition was issued were allowed to proceed. It is not yet known what effect the new condition will have upon the clay industry in the Duchy of Cornwall, but it is feared that idfficulty will be created because of the necessity to arrange so far ahead for ships in order that merchants may procure their licenses. At present, about 50 per cent of the clay exported from Fowey goes to the United States. The Cornish commodity has to compete with what is known as American domestic clay, and any handicap placed upon merchants or shippers in Cornwall must of necessity benefit the developmene of the local clay mines. The suddenness with which this order was sprung upon the trade shows again the necessity for an active organization to safeguard the interests of the trade. Since the outbreak of the war America, Canada and India have been the largest consumers of the Cornish product, and owing to difficulties of shipment the export trade to the European centres have been completely cut off, therefore it is sincerely hoped that as America is our best standby at the present time, no serious obstacle will be placed on that marof necessity benefit the development of the local clay to European ports should require closer supervision,

but to America, so far removed from, and so inaccessible to enemy countries, the difficulties and cost of re-export are such as to preclude the possibility of clay consigned to America reaching the enemy countries.

Mr. Reginald Martin, managing director of Messrs. Martin, Brothers, of Plymouth and St. Austell, was unaware of the order until he saw it in a paper. In a conversation with a representative of the Press he remarked that if the idea was that shipments of clay have been sent over to America and thence back again to the Continent, reaching our enemies through neutral countries, it was probably a mistaken one, as the cost alone would be prohibitive. In fact, once the clay reaches the United States the demand there for it is so general that there is no chance for it ever being sent back again across the Atlantic. Mr. Martin said that there were already some restrictions with regard to the export of china clay to the Continent. All shipments to Holland had to go through the Netherlands Oversea Trust. This aimed at keeping the product out of Austria and Germany.

Mr. L. G. Stephens, Consul for the United States for the South-west of England, said he had received information from shippers in different parts of Cornwall that the Government have prohibited the further exportation of china clay to countries other than British Possessions.

"Of course the Government have reserved to themselves the right to issue licenses governing exportation, and it is hoped under this condition the facilities which have existed in the past for shipping abroad the chief product of Cornwall will be allowed to continue as far as the United States are concerned, as in the past.

The American Consul stated that last year about 318,000 tons of china clay were shipped into the United States, which represented a value of over £40,000. In an interview with our own representative at St. Austell, Mr. W. Rose, J.P., of Messrs. North and Rose, said it was quite possible that abnormal quantities of clay exported to Scandinavia had given the Government authorities reason to suspect that some of it might be intended to reach Germany. He understood a slight amount of the clay was used at explosive factories. Germany and also Austria produced clay, but this was mostly in the south, and as the railways were being practically monopolized for military purposes, and the workers engaged in the war, the enemy might perhaps prefer to get their supplies overseas, if they could succeed in doing so.

With regard to America it is obvious that no clay that had been shipped there, on which the outward freight and import duty had been paid, would be reshipped across the Atlantic in the hope that it may eventually reach Germany. That was too extravagant a suggestion altogether, and we are hoping whatever the restriction on exports to Scandinavia on other Continental ports, we shall be able to get the United States excluded from this order. Any interference with the export of clay to America will stimulate the development of the American clay works, and when the people are forced to rely upon their home supplies, it will be difficult to get back the trade again for this country.

Mr. Rose had had an opportunity of seeing the American representative at Plymouth, and he expressed the opinion that there will be little or no difficulty experienced or any loss of trade through the new order

Mr. J. W. Higman, J.P., of Messrs. J. W. Higman & Co., thought the new order would cause some inconvenience, but no serious handicap to the trade. He had a vessel at Par loaded with clay for a French port, and a few mornings ago he received a telegram from the Plymouth Custome House stopping her sailing. Representatives were MFWY suchn n.vsup sa presentations were made by the brokers, and as the ship had "cleared" at Par she was allowed to proceed. That was the first intimation he received of the new order.

Mr. Higman mentioned that alumina was the only ingredient in clay that would be useful for war purposes. This was largely used in the manufacture of aluminum, which has various war uses.

LAURENTIDE CHANGES.

Several important changes followed a meeting of the directors of the Laurentide Company held in Montreal a few days ago. Mr. George Cahoon, Jr., formerly Vice-President of the company, was elected to the Presidency, succeeding the late Sir William Van Horne in that position. Mr. C. R. Hosmer was elected Vice-President, while Mr. J. K. L. Ross was elected a director to fill the vacancy by the death of the company's late President. Mr. George Alexander, who has been Secretary of the company for a number of years, resigned, and the position was given to Mr. W. F. Robinson.

MR. J. K. L. ROSS,

The directors also decided to call a special meeting of the shareholders towards the end of this month, "To confirm the sale of the power and the creation of a new company to be known as the Laurentide Power Company, which will take over and operate the company's water power."

The company is preparing to develop 125,000 horse power. It is expected that the Shawinigan Power Company will undertake to market a considerable portion of the power developed by the Laurentide Compay. Details regarding the stock distribution, and the manner in which the shareholders will be affected will be made public at the special meeting to be called towards the end of the month.

President Moore Tells of Paper Conditions

(Special to Pulp and Paper Magazine.)

New York, Oct. 10, 1915.

Frank L. Moore, President of the American Paper and Pulp Association, gae a very interesting analysis of the conditions surrounding the paper trade in the United States at the meeting of the Technical Section of the National Exposition of Chemical Industries, held in this city during the past fortnight. President Moore, said in part:—

"This section of the American Paper and Pulp Association was started at the last annual meeting, held in this city in February. This exposition of the chemical industries where we are holding our meeting is a remarkable evidence of the scientific development of the country. As these expositions continue year after year, I predict it will be the same as with other organizations. It will grow, not only in size, but in interest and the attendance will increase.

"Now I have been very much impressed in my visits here, two evenings this week, to find various exhibits in which I am directly interested as a manufacturer. It would have taken a great deal of time and cost me a good deal of money if I had been obliged to go to the various plants or places where the machinery is built and in operation to investigate. It is all here, however, and the Technical Section will, I hope, some day become strong enough to conduct an exhibit of its own, where can be shown the improvements in paper and researches of the Government and of mill chemists, all in connection with its regular meeting. I hope I will live to see that accomplished. Your work brings together manufacturers, chemists and engineers and technical men from all lines, kinds and grades of pulp and paper. You are different from any other branch or division of the American Paper and Pulp Association in that respect and, that is why you are so important to the industry as a whole.

"We paper manufacturers compete with foreign trade, and having foreign trade, we must develop the technical side. I know of many mills employing technical men to-day that a few years ago would have been considered unnecessary. To-day, however, those technically trained men are making money for those mills, and that is where the Technical Section is going to help the industry in a way in which the American Paper and Pulp Association could not do with any other division. I do not intend to speak disparagingly of the work of any of the other divisions, because the work laid out for them is being handled in an excellent and satisfactory way, but it is different work.

"You have on your programme to-day papers and discussions by practical men, men who have been 'through the mill,' as it were, and know what they are talking about. When a man is through talking, I hope you are going to arrange it so you can ask him questions and get a discussion started. That is the way to bring out facts and accomplish things. You take the meeting of this section in Fbbruary. There were two or three papers read there, and the first time I was at the mill after that, my superintendent said to me: 'I want to belong to that Technical Section.' I asked him if he did not want to come down here to-day. He said: 'No, I don't want to come down now, but,' he added, 'there was one paper in particular,' and he kept at me, and insisted on me reading and studying it. He said: 'It has given me more ideas on that particular subject than anything I have ever been able to gain elsewhere. That is the kind of work that is going to make this section valuable to the mills.' Now, I would suggest that we have some committee to which questions on technical subjects, or any subjects that might come up in connection with problems that you may be working out in your own mills, can be referred or have them handled by the secretary and referred to whatever committee he thinks advisable.

"There is another matter, too, which I believe this section should handle, though it is something that in a way has been already been brought up and disposed of by the American Paper and Pulp Association. That is the question of tests or standardization of tests between imported pulps and the importers and the consumers. I believe the standardization of processes or methods, and the adoption of tests for pulps should come from the section, which should be represented on the committee of the parent association.

"There is the question that is more to the fore to-day than any other, perhaps, in the minds of paper manufacturers and that is the color situation. About the only color that anyone sees to-day is black—everything appears black. Now, if we could use one black paper to print on all might be supplied with it.

"However, I am not going to say very much on the color situation, because I have not very much to say, except I do not believe any color will come in from Germany until one of two conditions prevails and that is that the war ends and the freedom of the seas will be given to commerce and shipping and the other is that cotton is allowed to enter Germany.

"I make that statement because I have seen within forty-eight hours cablegrams, wireless messages and letters that have passed between the Imperial German Government and this country, and between this country and Germany, and unless there is something back of it all, concerning which we are ignorant, what I have said represents the conditions that prevail in the color industry.

"A great deal is being published in the newspapers regarding the color situation which can hardly be regarded as facts. We must bear in mind that a color industry that has taken years and years to develop in Germany cannot be reproduced here in this country in a month, six months, a year or a year and a half. It is going to take time to start the industry, and I am in accord with the work that the Government is doing and the conditions which confront all manufacturers who use color, of whatever name or nature they may be. I believe the Government should provide an appropriation of at least $25,000,000 to develop the color industry here.

"The Government is in a position, I believe, if this is properly presented to them, where their appropriations could be largely increased, I might say also that in order that the paper manufacturers might share in the dyestuffs, and know what was being done in case dyestuffs should come into this country, which some few months ago we had hoped would be the case, that I was asked to be one of the incorporators of a company to which two or three shipments of color, which at that time were expected to come here, could be 'cleared' to and I was insistent in doing that, in order that the paper manufacturers might receive their share of those shipments. I had every assurance that they

would but the unfortunate sinking of the Lusitania brought all negotiations of that kind to an end, just at the time when it was expected that some two or three boat-loads of color would be sent over.

"I am informed this morning that everything is being done that can possibly be done to deliver the raw material or the basis of colors to manufacturers in Switzerland, so that Swiss color manufacturers can increase their output. That is the word we get this morning, and this government here is assisting in that to every possible extent, not only in the interests of the paper manufacturers, but the interests of all users of color in this country. What the output will be or what the result will be, I do not know. That is problematical. Your guess perhaps is as good as mine on a thing of that kind.

"I am pleased to see so many here; to see the interest that is shown in this section, the success of which is going to depend upon you gentlemen. There will be various committees appointed to-day; committees that I know from experience in past work are now powerless, but their work is curtailed unless each individual member of the organization will assist and make suggestions—criticize what they are doing. When you do that, then you are going to have an organization that is going to be worth while, and I predict between now and the next meeting of the American Paper and Pulp Association will have three or four times the number of people present that you have here this morning."

JULY PAPER AND PULP IMPORTS.

(Special to Pulp and Paper Magazine.)

Washington, D.C., Oct. 10, 1915.

The Department of Commerce has just issued the following statistics and the imports of pulp, printing and wrapping paper into this country during July.

Mechanically Ground Wood Pulp.—From Sweden 200 tons. From Canada 14,172 tons. Total, 14,342 tons, valued at $219,132.

Chemical Unbleached Pulp.—From Norway 1,678 tons. From Sweden 7,622 tons. From Canada 7,589 tons. Total 18,889 tons, valued at $735,332.

Chemical Bleached Pulp.—From Germany 105 tons. From Netherlands 60 tons. From Norway 2,979 tons. From Sweden 923 tons. From Canada 784 tons, valued at $249,129.

Printing Paper.—From Netherlands 29,741 tons. From Norway 4,865 tons. From Sweden 162,000 tons. From England 76,411 tons. From Scotland 60,454 tons. From Japan 11,760 lbs., and from Canada 62,888,566 lbs. Total 63,233,806 lbs., valued at $1,229,321.

Wrapping Paper.—From Denmark 62,723 lbs. From France 40 tons. From Norway 75,589 tons. From Sweden 359,560 tons. From England 15,896 lbs. From Scotland 8,319 lbs. From Canada 977,573 lbs. From China 650 lbs. From Hong Kong 560 tons. Total, 1,500,710 lbs., valued at $45,653.

KESWICK LUMBER CO.

The Keswick Lumber Company, an American-controlled company, operating in New Brunswick, has been placed in the hands of a liquidator. The manager, Mr. W. P. Lowell, says the difficulty is due to the assets being in such a condition that they cannot be realized on readily.

Ottawa Notes

(Special to The Pulp and Paper Magazine).

Ottawa, Ont., October 10.—Mr. J. C. Tully, of this city, formerly a well-known manufacturer of paper bags, with headquarters on Nicholas street, died two days ago as the result of a fall down stairs. The late Mr. Tully was returning from his attic when he slipped and fell to the bottom of the stairs, death ensuing about an hour later. The deceased was born in the Province of Quebec 46 years ago, but had lived in Ottawa for many years and had been for the greater part of that time engaged in the business of manufacturing paper bags and other such specialties. He is survived by a widow and two children and his father.

Several important matters affecting lumbering and pulp and paper interests were considered by the International Joint Commission during its sitting in Ottawa last week. One of these was the hearing of the St. Croix River water power case in which application for water supply was made on behalf of the St. Croix Manufacturing Company. The Sprague Falls Manufacturing Company asked for the diversion of water near Grand Falls, near the St. Croix River, which is a well-known lumbering stream. The Province of New Brunswick has made representations in the interests of the province, claiming that these interests should be protected and pointing out that the treaty calls for an equal diversion of boundary water. A board of engineers was appointed to deal with the caes which will come up again.

Another matter which was considered but will require further consideration is the investigation of the levels of the Lake of the Woods. There are a number of different interests concerned, among them being the Koochiching Paper Company, which has a very large plant at International Falls, Minn., and naturally there is a great difference of opinion between all these interests as to whether or not the levels of the lake and its tributary streams should be lowered.

There is considerable speculation among the paper trade as to whether the discovery that the Germans are now making explosives from wood fibre will lead to the addition of wood pulp to the list of contraband articles and its prohibition as an article of export from Canada to various European countries. The general view is that even if such a prohibition be put in force it will not affect Canadian trade to any great extent as our European shipment of wood pulp is now very limited, by far the greater bulk of it going to the United States.

Urging a reward from heaven as an inducement, the Cadillac Paper Company, of Detroit, endeavored to get the Capital Press of this city to pay full price for a supply of rags furnished which proved to be very dirty. A letter stated that the Cadillac Company had suffered loss by fire and must depend on outstanding accounts to rebuild. "You will be doing a noble, good deed and the Almighty will reward you," the letter said. However, the local firm refused to pay more than a fraction of the price and the case came to court, where the judges found that the offer of the Capital Press was a fair one and dismissed the action.

The Quebec Government during the past few weeks has prosecuted a large number of settlers in the Ottawa

and Gatineau districts for negligence in setting fires, endangering the limits of local lumber or pulp and paper manufacturers. Evidence in these cases was supplied by the Lower Ottawa Forest Protective Association, of which J. R. Booth, E. B. Eddy and other local paper manufacturers are members, and which overseas some twelve thousand square miles of timber wealth in the Gatineau and Lievre basins. Two men were fined $15 and costs each in the Hull Police Court; two at Bryson, Que., and seven at Lachute, Que. All these were cases wherein fires were set without a permit. Through the activities of the Forest Protective Association the number of fires in this district has already been reduced very considerably.

The water in the Ottawa River continues to maintain a level considerably higher than was the case at this time last year, and as a result all the local pulp and paper companies are profiting. The E. B. Eddy Company announces that it will run at full capacity during the whole winter if conditions permit, and so will the Booth Company. Both concerns, however, have practically now closed their sawmills.

Preliminary figures for the trade of the twelve months ending with July 31, and thus practically for the twelve months of war, have been issued by the Trade and Commerce Department. They indicate that while imports of paper into Canada have grown smaller exports of pulp and paper have increased, though less wood was sent out of the country. Imports for the twelve months ending July of 1915 were $4,839,213, as compared with $7,430,874 the previous year. Exports were $16,557,538, or about three millions more than in 1914, when they were $13,876,387 some $13,876,387 of the former sum going to the United States. Exports of pulp were $9,205,359 in 1915, as compared with the 1914 showing of $7,384,914. The export of pulpwood was $6,397,389, or less than the 1914 total of $7,134,175.

DO YOU THINK OF SAFETY.

When you leave your home for your day's work, do you remember that constant care is necessary? Do you, when you arrive at the office, factory, or shop, bear in mind your own safety and that of others? To think first of safety means consideration for others; it means lives spared and fewer vacant chairs.

Most accidents can be prevented, but what is each one of us doing to prevent accidents? We must not expect that care will be taken for our safety and never take thought for that of another.

It is estimated that man's average earning power is $700 per annum. Some of us receive more and some less, but whatever we earn each year will be reduced after a serious accident, and will be stopped by death. What are you going to do about it? The obvious thing to do is to learn safety—to insist upon others doing their work in the safe way—to point out to the proper officials unsafe practices and unsafe machines—to take no chances. It may seem unnecessary to tell you this, but what of each year's toll of life and limb? Get the safety habit and pass it along as an heritage to the children.—Bulletin issued by Ontario Safety League.

Asbestos.—A French commission firm desires to get in touch with Canadian concerns who wish to sell their products in France on a commission basis.

The Story of an American Home

The Western Forestry & Conservation Association have drawn up an interesting "Story of the American Home," which they have published upon the back covers of the programme for their annual conference to be held in San Francisco on October 19 and 20. The "Story" is in the form of a series of questions and answers, as follows:—

What are the best things a nation has? Homes.
What are homes usually built of? Wood.
What furnishes homes? Wood.
Where is the home centre? The fireside.
What burns there, reflected in happy faces? Wood.
Where do wives and children watch it?
In wooden chairs.
Where do the little feet patter all day long?
On wooden floors.
Of what are household articles mostly made?
Wood.
And our books and newspapers, that make us civilized? Wood pulp.
Where does our food come from?
Wooden fenced fields.
Where is it stored? Wooden barns.
How is it packed? In wooden boxes.
And then? Over wooden ties.
Is that all?? And wooden docks.
How does it reach us? In wooden wagons.
What cooks it? Wood.
What lights the fire? Wooden matches.
Where does our water come from?
Woodland springs.
What does it see on the way?
Wood-sheltered game and fish.
What does it do on the way??
Water the wooden fenced fields.
What supports the nation's homes?
Its industries and payrolls.
What is America's greatest manufacturing industry? Lumbering.
Altogether, then, what does most to build, supply and support American homes? WOOD.
Shall we give it a square deal?
THE FOUNDATION: FORESTS AND FOREST INDUSTRY.

THE SOUTH AFRICAN PAPER MARKET.

A writer in the British South African Export Gazette says: Prior to the war, Germany was shipping considerable quantities of printing paper to South Africa, the prices quoted being much below those of English and Canadian firms. Sweden has since entered the market, and is, I understand, receiving some excellent orders. This leads me to suggest to the Customs authorities in South Africa that it may be advisable for them to keep a particularly careful watch on this trade, for there is reason to believe that much of the paper supplied is made, not in Sweden, but in Germany, whence "Danish" sugar and other disguised Hun products are said to emanate. The new regulations relating to Consular certificates of origin, which came into force recently, should, however, effectually check any further illicit trade of the kind with the enemy. Local newspapers have to make shifts owing to delayed arrivals of paper.

UNITED STATES NOTES

The New England Paper Jobbers' Association held its first meeting of the season during the past fortnight at the Vesper Country Club, Lowell, Mass. A large attendance indicated the success of the experiment, and many favorable comments were heard during the afternoon and evening.

* * *

According to the officials of the Forest Service there is some fine timber available for pulp in the northwestern part of Montana. It is said that there is 700,00,000 feet board measure located on the Yaak River, which is entirely accessible, and that there is plenty of power for a pulp mill, located on one of the best railroads. Officials say that this timber offered can best be utilized in an operation manufacturing lumber of the better grades from the finest logs and pulp and paper by both the ground wood and the sulphite processes from the poorer logs.

* * *

The New York office of the American Writing Paper Company have been moved from the eighth floor of the old Times Building, 41 Park Row to the ninth floor of the same building. It is the intention of L. F. Hayward to make the New York home of his company attractive and at the disposal of the trade. New furniture and new furnishings have been ordered, and every endeavor is being made to have the facilities for handling business as adequate as possible.

* * *

Henry D. Silverman, representing M. Gottesman & Son, wood pulp importers, 18 East 41st Street, New York, has returned from a six months' trip through Norway and Sweden. Mr. Silverman brings many interesting stories of war conditions in Sweden and Norway, and is very optimistic regarding the future of the pulp market.

* * *

Herbert A. Smith, editor of the Forest Service, has just returned from a two months' inspection trip. Mr. Smith visited headquarters of the National Forests in Montana, Oregon, California, and New Mexico, looking into the recreational possibilities of the forests and also the municipal water power situation.

* * *

The Inland Empire Paper Company, is making considerable headway in building up its trade, and the mill of Spokane, Wash. While the plant is a model one, turning out a large quantity of ground wood pulp, it still lacks a sulphite mill, and in order to secure its own supply of sulphite pulp, the company is said to be preparing to install a sulphite mill.

* * *

Consulting Chemist F. M. Williams, of Watertown, N. Y., who has recently worked out a formula for the manufacture of dyes to be used by the paper manufacturers of this country, has been in Canada for the past week. He left early last week for Montreal, where he is at the plant of the Howard Smith Paper Company, Ltd., making some paper and pulp investigations.

The Hawley Pulp and Paper Co. of Oregon City, Ore., has added special equipment to its plant. In common with the other mills in Oregon and Washington the wood pulp grinding department of this plant has been shut down for some time on account of the low water.

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The Marseilles Wrapping Paper Company has been incorporated with a capital of $125,000 to rebuild a plant at Marseilles, Ill., formerly occupied by a company of the same name, and which mill was almost wholly destroyed by fire two years ago. A. B. Smith, of Garrett, Ind., is president, treasurer and manager of the new company. The mill will be ready to run about April 1st, 1916.

* * *

R. Thomas, who is promoting the organization of the Thomas Pulp and Paper mill, is now at Albany, Me., where it is proposed to locate the planned plant. The intention is to sell stock and bonds to raise the necessary capital. A committee appointed by the Albany Commercial Club is working with Mr. Thomas to perfect the proposed organization and incorporate. Options are said to have been obtained on large bodies of timber to be used for the manufacture of pulp.

* * *

The California Paper and Board Mills, of Antioch, Cal., is fairly busy on box board and other lines, and with the holiday season coming on, a good run of business is expected. The Northern Paper and Board Mills has completed a fine modern plant at Summer, Wash., which will be placed in operation in the near future. Waste paper, obtained from Tacoma, Seattle and Portland, will furnish a large part of the raw material used.

* * *

The Pacific Coast Paper Company has noted a gratifying increase in business the past two weeks on its lines of book and print papers, cover papers, etc., in this market. The wrapping paper situation in California is fair. Thomas H. Doane, the manager of the company, has had his official duties cut into lately by being called to serve upon the United States Grand Jury.

* * *

The sulphite plant of the Northwest Paper Company, Cloquet, Minn., which has been in the course of construction for the past eleven months, has commenced operation. This is the only sulphite mill in the state of Minnesota at the present time.

* * *

In preparations for steady operations during the coming winter, extensive improvements are being made at the plant of the Alexandria Paper Company, of Alexandria, Ind.

* * *

John Ball, representing Price Bros. & Compay, Limited, Jonquierres, Quebec, was a visitor to the Chicago paper trade during the past fortnight. He was accompanied by James Mix, who is now manager of sales of the company.

THE TECHNIQUE OF DRYING IN PAPER MAKING

SLOW DRYING AT LOW TEMPERATURES PREFERABLE TO SUDDEN APPLICATIONS OF HIGH HEAT

Experience plays an important part in the construction of drying equipments. Theoretically, and in a practical respect, suggestions are always desired and may prove fruitful in various directions. Plants are still to be found that give cause for complaint because they do not fulfill their purpose. Sometimes the only fault is that suitable and necessary space and place for the equipment has not been available.

Drying, especially card drying, in the paper industry, has been handled according to the most different methods. Through experience and special investigations it must, of course, be known to what temperature the product to be dried should and can be heated. The temperature is dependent on the pulp, the thickness, on the form and size and sundry other characteristics of the product to be dried. Thus, for instance, as a suitable temperature for drying card, 122dg. F. is quoted. It is important, however, whether the work is to be done under light or heavy air-pressure, and whether that material to be dried is more or less wet.

As a rule the technological principle should be followed that it is more satisfactory to work not with highly heated air, but with quite a large volume of air. It can also be said that slow and gradual drying is better than an all-too-sudden heating, because in the latter case defordation of the material to be dried is inevitable. Hot air, acting suddenly in drying card, may cause tearing and warping of the goods. Hence it is immaterial how and where the dry air is admitted to the drying space as regards the drying channel, and it must evenly traverse and fill it. Only the proper line of direction of the air can ensure a good result. For this reason the channel-shaped cross-section of the drying space, of suitable length, is better than a closetlike space, because only by forcing in air —and even then sometimes not completely—can it be carried elsewhere and over the material to be dried. It is the channel form that makes it easier to make the air flow through the entire-cross section. This pouring through—flowing—of the air should be in an opposite direction to that in which the material is introduced; that is to say, the latter should come in where the air passes out and should leave the drying channel dried where the air comes in. An uninterrupted operation is insured where the material that is being dried travels in the opposite direction to the air, so that the wet goods, just introduced, come first in contact with the moisture-laden air and are then gradually brought into contact with the flowing warm air, more and more capable of absorbing moisture. It is, consequently, not desirable for the goods to remain long in one place. It is best for a mechanical device to carry the goods slowly through the drying channel, in which the air moves in the opposite direction.

It is best to admit the supply of heated air from below. It can be blown in and forced through the channel. This may result in difficulties, because, as stated, not all classes of cardboard can withstand the blasts of hot air. Much more important than high temperature of the air is its constant movement, so that as large a volume of air as possible passes over the cardboard. For this reason it is advisable to aid the movement of air in the channel by suction, having an exhaust fan at the other end to promote the circulation of air. By this means, also, an excessive pressure in the drying place is avoided, by which the moisture-absorbing capacity of the air is only reduced and the drying retarded or, under some circumstances, greatly delayed. The fan must not be too small, as a fan of small diameter must be run at high speed to move the necessary quantity of air. This entails heavy wear and increases power consumption, which raises the cost of operation. The blowing and exhaust fans can conveniently be operated by electric power if it is available.

As a rule, steam is used for drying, the drying air before being blown into the drying space, being heated by passing over steam coils. This is referred to as steam drying.

The air moved by the exhaust is best blown off in the open, so as to get rid of the moisture in the most certain manner, and because the contact of this water-laden air with walls, ceilings, etc., results in condensation and the creation of drips, while where the cooling off is too sudden even fog cannot be prevented. The steam for warming the heaters or the simple pipe coils need not be of high pressure. Exhaust steam can also be used because it carries enought latent heat on insure a sufficient warming of the air. The space in which the heating of the air is effected must not be made too small, so that the heaters installed—smooth ones are preferable to the corrugated kind — are in all parts accessible.

It has already been mentioned that for drying card for instance, which will, of course, specially interest the readers of this paper, no higher temperature than 122 dg. F. is desired. Above all things, it is found that in some drying outfits the dry air does not pass evenly through the drying channel, and the card is thereby caused to dry more quickly in some places—in others, slower. More frequently it is discovered that the sheets dry more rapidly at the edges than in the center, and as a result are usually crooked so that adjoining sheets touch one another, thereby preventing even contact with the air and thus retarding the drying. The warping and crookedness of the dried card sheets is an impediment to the regular packing and to the glossy finishing usually required. Smoothing and weighting when in stacks does not suffice; we must have recourse to the sprinkling of the card, which requires much space and time to impart to the sheets the moisture required to lay them flat so that they can be given a glossy finish.

Translated for Paper from the Wochenblatt für Papierfabrikation.

FRASERS LIMITED.

Frasers Limited will shortly erect a $100,000 lumber mill on the Miramichi River, in New Brunswick, with a capacity of a million feet of logs every two weeks.

ELECTROLYTIC BLEACH PLANTS FOR PAPER MILLS

For the manufacture of white paper pulp, the use of chloride of lime has become almost universal. In earlier times pulp was bleached by means of chlorine gas, which was produced by the action of sulphuric acid upon a mixture of salt and black oxide of manganese. The difficulties of this process have been overcome in later years, by the use of "bleaching powder". In dry form this substance is unpleasant to handle, and there are many losses connected with use. As a consequence several pulp mills have been led to make their own "bleach" in liquid form at the mill.

The methods commonly used are modifications of the principle of electrolyzing a common salt solution and passing the liberated chlorine gas into milk of lime, making in this way a bleaching solution, similar to the one made by dissolving dry bleach in water. There is formed simultaneously a solution of caustic soda, which can be utilized or sold as local conditions may decide.

The general idea of a bleach plant is to use this process as an auxiliary to the pulp mill, supplying bleach for use on the pulp. While this view is a natural one for the manufacturer of pulp, it is an unnatural one for the "bleach" maker, and it is with this thought in mind that I would draw attention to possible advantages which might be gained from his last ideas.

The electrolytic process is a more or less complicated one, having frequently as many distinct operations as the manufacture of the pulp itself. The salt is purchased by the carload, and this must be unloaded and made into a solution. Power must be brought from some central station or made separately for the bleach. The brine and the electricity are brought together, caustic soda and chlorine gas being formed by the contact. The lime must be slaked and made into a milk. The chlorine gas is absorbed in this milk, after which it is settled, and the clear supernatant liquid is delivered to the bleachery. The sludge is worked over and over until the lime is used up. The caustic soda solution is concentrated, and delivered as a strong solution or is brought to the solid form to be sold as such. Each part of the process has its own problems. It would seem therefore that the manufacture of bleached pulp should be considered as a whole unit, the pulp mill adapting its operation to that of the bleach plant and bleachery in order to make the best conditions for the manufacture of the final product.

All who have handled chlorine gas are familiar with its corrosive nature. There are but few substances that can withstand its action, so that the design of the cell is one which has provoked much thought in the past, and there are many variations in the detailed design of this part of the process. There are, however, two general principles which obtain in all the work. The first is low renewal cost. Those parts of the cell which become useless through corrosion must be so made that their renewal is a minor part of the process. The second principle is low operation cost which means that labor and power must be kept at the minimum, as well as the loss of material. While these two principles apply to all processes in a general way, they are particularl noteworthy in a bleach plant. The variations which can be made in such a process are almost infinite, and the success or failure of an installation depends upon the proper adaptation of these to the particular application.

To elaborate this idea more fully, the raw materials may be considered as so much salt, lime, power, labor and coal. If the salt is the most expensive item, the process should be designed and arranged to keep the salt losses at a minimum, sacrificing other materials to save it. If, on the other hand, power is expensive, the cells should be so designed that they have a high efficiency, using a low voltage, and every effort should be made to keep the power cost down, letting other losses take place if it will save power. It happens, however that many mills have excess water power, and labor is difficult to get. The sacrifices can then be made on the power end, to save on the number of men required to care for the plant, and machines can be used to replace the hand labor. Under certain conditions it is of advantage to run the cells continuously and, where this is possible, large storage capacity will pay for the savings to be made. In this particular case, the arrangement of the pulp mill work will assist materially. It might also make it worth while to have the mill go into the manufacture of other chlorine compounds so that the bleach plant can be operated as a paying proposition apart from the pulp manufacture.

The formation of the caustic soda simultaneously with the chlorine sometimes introduces problems which make the installation of a process difficult. Many times the statement is made that the caustic soda can readily be disposed of, either as a liquor or in solid form, but this does not always work out well in practice. Strong caustic soda solutions have been used by many of the firms who make soap, and the conclusion seems to be that the finishing, or solidifying of the caustic eliminates impurities which are in the strong liquors so that the use of the solid caustic in the manufacture of soap seems preferable. The process of solidifying caustic is a trade in itself, and it is not so simple a process at it might appear. The trade generally wish a pure white caustic, and the shading is a problem at times. To keep the half finished caustic from frothing, and to know just when to apply heat or not are points worth examining before considering an installation of this kind.

The design of the plant should be made so that standard apparatus can be used as far as possible. Any chemical process of this nature requires a large amount of special material. In some instances the inclination has been to make all the other parts of the process dependent upon the way these special parts work out. It would seem, however, that since these are special anyway, the rest of the plant should be made standard. Take the cell, for instance: this must be special, each part being made to meet the object of the designer. The power apparatus is a standard machine made by many different manufacturers. The cells, therefore, should be the one to be adapted to the plan, and not the electrical machinery. This latter should be of a standard voltage and winding, while the cell can be made to take a current at the voltage, so that the capacity of the plant is what is desired. The motors and lighting system can then all be operated from the same busses. As already

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Contribution to "Paper, Inc." by F. G. Wheeler, Chemical Engineer, Kimberly-Clark Company, Neenah, Wisconsin.

pointed out, the cell should also be designed to have a high or low efficiency, using power or labor in proportion to the respective costs, so that the overall can be made a minimum. In this way a cell plant can frequently be adapted to a mill where arbitrary units do not show an advantage.

In conclusion, it would appear that a bleach plant might be made an advantage to a pulp mill by the observance of two general principles. These are: first, the adjustment of each of the various factors within the bleach plant which keep the final costs low, or the real commercial efficiency high; and second, the adaptability of the pulp mill to those conditions which favor this commercial efficiency in the plant.

EDIBLE WOOD

Strange as it seems, the idea of deriving food materials from wood is an old one. As far back as in 1816-17, when Europe was visited by famine, the chancellor of Tübingen University, Prof. I. H. F. Autenrieth, in fact, wrote a pamphlet on the problem ("Handbook of Wood Baking"), though nothing seems to have come of his ambitious plans..

The present war, which lends additional importance to all economical problems, has induced Prof. Haberlandt, Director of the Institute of Vegetable Physiology, at the University of Berlin, to take up the preparation of food and fodder from the wood of German forests. According to a memoir recently submitted to the Berlin Academy of Sciences, this, as it were, constitutes a store-house of building materials for the organism, containing, especially in winter, considerable amounts of sugar, starch, fat and small quantities of albumen. These materials, however, are only found in live wood, sap-wood, and the boughs and branches, whereas the heart-wood of the trunks does not contain any. Moreover, their amount differs considerably according to the different kinds of wood. Soft wood, such as lime trees, birches, pines, are, in winter, nearly free fro many starch, while containing considerable quantities of fat; hard woods, on the other hand, contain large amounts of starch, even in winter. According to Haberlandt's personal observations, the wood of these trees are made up of starchy tissues to 1-5 to 1-4 of their volume. From the above is seen that when eating wood large quantities of indigestible ballast are introduced into the organism, from which the digestible matter can only be derived by a thorough grinding process, crushing all the cell walls. The various kinds of woods, of course, are not equally adapted to serve as food or fodder; in the case of oak and willow, the tannin contained in the wood is in the way, and with fir and pine wood, the resin. Maple, poplar, elm, lime tree and birch are those primarily suitable as "food" trees.

Extensive investigation will, of course, be required to ascertain the exact food value of wood. Only optimists may hope ever to have pure wood meal bread adopted on a large scale, while the use of flour mixed with a certain percentage of wood meal would seem to be quite practicable. Moreover, there is every reason to suppose that wood meal will before long play an important part as fodder, provided the grinding expenses bear a favorable ratio to the food value of the product. If so, the wood-working industries will find a most advantageous market for their waste.

RUSSIA'S FORESTS.

Russia now occupies first place among the nations of the world in the extent of its timber resources, the value and quality of two-thirds of which are practically unknown. The total area of the empire is about one-seventh of the land surface of the globe, and 39 per cent of it is under forests. Those in European Russia cover an area of 474,000,000 acres; in Findland, 50,500,000 acres; in Poland, 6,700,000 acres; and in the Caucasus, 18,600,000 acres; a total of 549,800,000 acres, exclusive of Siberia. In the Ural Provinces, forests cover 70 per cent of the area, and in the four lake Provinces 57 per cent. It is estimated that in western Siberia alone there are 465,000,000 acres of virgin forests, and eastern Siberia, while not so richly endowed, has sufficient timber to supply the world's demand for years to come.

The Government owns 285,598,941 acres of forest land in European Russia, 12,826,387 acres in the Caucasus, 360,519,435 acres in Asiatic Russia, and 288,742,000 acres in the Amur region, a total of 947,686,763 acres. Twenty-three per cent of the forest land belonged to landed proprietors and 9 per cent to the peasantry in 1910.

The principal timber lands of eastern Siberia are in the valleys of the Amur River system, which cover an area of about 200,000,000 square miles. Of this area, only about 400,000 miles is considered available for timbering, but according to local calculations, allowing 45 merchandable trees to the acre, this would give some 11,520,000,000 trees. As the time required for these trees to mature is placed at 100 years, 115,200,000 trees could be cut per annum without diminishing the forests, with proper reforestation methods.

The Russion Forestry Department places the total timber land in Siberia at 810,000,000 acres, of which two-thirds can be successfully placed on the market.

POWELL RIVER PULP & PAPER CO.

Hon. Thos. Taylor, Minister of Public Works in the British Columbia Cabinet, in a recent interview, expressed himself as much impressed with the activity along the northern Coast, particularly at Powell River. The works of the Powell River Pulp & Paper Company he describes as a perfect hive of industry. Employment is given to a force of 1,200 men, counting those at work in the forests as well as in the mills, and the community is a prosperous and contented one.

The output of the paper mills totals in value $3,000,000 annually. The monthly payroll from $75,000 to $100,000. The cost of the plant is slightly over $6,000,000. Work was begun in 1910, and the company started turning out pulp and paper in 1912. Constant additions are being made to the plant in order to cope with increasing business.

A POOR EDUCATIONAL SYSTEM.

Mr. Rhys D. Fairbairn, President of the Ontario Association for the Promotion of Technical Education, in an address delivered at the 1915 annual meeting of the Commission of Conservation, said: " . . There are probably 100,000 boys and girls in Canada of an age from 14 to 16 years who every year become engaged in occupations connected with the manufacturing, agricultural, mining, or transportation interests. The present general plan of education does not provide sufficiently for these young people."

Substitutes for Alum

In a discussion of this subject in the Wochenblatt it is stated that for complete substitution there is at present hardly any method in sight other than that proposed by Dr. Wurster more than a decade ago—the employment of bisulphates, for which he was granted a patent in 1909. This patent applies to the precipitation of rosin size by sulphates of the metals, the earth alkalies and of zinc, which as technical refuse products are cheaply obtained, thus sodium bisulphate, $NaHSO_4$, occurring on a large scale as a byproduct of the manufactuer of nitric acid may be used.

For the reaction in the precipitation of the rosin size, the ready splitting off of half the sulphuric acid was first to be considered, if we follow the ordinary method of chemical observation: $2\ NaHSO_4 = Na_2SO_4 + H_2SO_4$.

This decomposes the resinate of soda in rosin size in much the same manner as does the sulphuric acid in alum. Sodium bisulphate shares with alum the property of being, to a certain extent, a storage for sulphuric acid, of which a portion, although originally fixed with salt, is readily split off.

For the practical paper maker the proportion of substitution and the porosity are of importance.

The molecular weight of $NaHSO_4$ is 120. As the salt crystallizes with one molecule of water, 276 parts of $NaHSO_4 + H_2O$ yield 98 parts of H_2SO (besides 142 Na_2SO_4 and 36 H_2O).

One part of sulphuric acid capable of reaction is therefore contained in 2.816 parts of the sodium bisulphate. In consideration of the circumstance that we require of alum three times the quantity of alum containing the equivalent quantity of sulphuric acid, the substitution proposition is, 1 part of sodium bisulphate replaces 2.414 parts of alum.

The pure crystalline product of commerce closely approximates this value. The cheap, impure crude substance is, as may be understood, somewhat inferior to it; by experiment we arrive at values that correspond to a substitution proportion of 2.23 to 2.28 parts of alum by 1 part of sodium bisulphate. By titration with normal soda lye, substitution proportion may readily be determined.

DEVELOPMENT OF INDIA'S FORESTS.

A Review of Forest Administration in British India during five years ended June 30, 1914, issued by the Department of Revenue and Agriculture, states that the demand for forest products, and several industries in recent years there has been a noticeable increase independent on their supply have been, or are about to be, started.

Another important forest industry in which, under departmental management, marked progress has been made is the manufacture of rosin and turpentine from crude rosin obtained by tapping pine trees in the Himalayan forests. In the Punjab and the United Provinces new distilleries have been erected, and in 1913-14 these turned out 27,429 maunds of rosin and 58,803 gallons of turpentine, as compared with 6,584 maunds of rosin and 14,604 gallons of turpentine ten years earlier. The Indian demand for these products, which are largely used in the manufacture of paper, paints and varnishes, is considerable, and the local out-turn has already affected imports from other countries. In the Punjab a moderate plant has been erected near Lahore, and a large increase in the out-turn is also expected in the United Provinces.

New Issue of Lockwood's Directory

We beg to acknowledge the receipt of a copy of Lockwoods Directory of the Paper and Stationary Trades for 1916. This publication contains much useful information in compact form, and therefore is invaluable to all interested in these industries. The 1916 edition, which shows an improvement over last year's, gives accurate details on many phases of the trade, among which are especially to be noted the following:—

Paper and Pulp Mills.

All the paper, wood pulp and chemical fibre mills in the United States, Canada, Mexico and South America, geographically arranged, with the names of officers; a complete statement of mill equipment; kind of power used, product of mills, and total production of 24 hours.

Mills Classified According to Products.

All the mills making the same kinds of paper, boards or pulp are brought together under headings descriptive of their products.

Makers of Paper Specialties.

Giving the names of concerns that convert paper to special purposes. Where to find "Paper Specialties" is answered in this list.

Paper Dealers.

Wholesale paper houses with indicating marks telling whether the business is done through stores or from warehouse or mill direct; large concerns selling paper as a side line are also included.

Pulp, Rag and Paper Stock Dealers.

Names of houses dealing in rags, old papers, sulphite, sulphate, etc., including importers.

Converters of Paper.

Included under this heading are those concerns that turn out the following products: Glazed papers, coated papers and boards, waxed and parchment papers, toilet papers, saturators of roofing stock, paper bags, paper boxes, blank books, envelopes, pads and tablets, tags, wall papers, etc.; also a list of twine manufacturers.

Wholesale and Retail Stationers.

Leading stationers and others handling stationery in the United States, Canada, Mexico, Porto Rico, and the Philippine Islands. The list printed is considered the most complete and most accurate published. The character of the business done by each house is indicated.

Watermarks and Brands.

All the leading titles used in the American paper trade are included, only the name of the owner in each case being given.

Trade Associations; Statistical Information and the Advertisements.

the latter comprising the most complete guide to the sources of supply and machinery and raw materials used in the industry.

PULP AND PAPER NEWS

The Canadian Society of Forest Engineers, with headquarters in Ottawa, has been granted a provincial charter. The corporation, which is without share capital, is for the purpose of advancing its members in the theory and practice of forestry by the discussion of technical and professional topics, to promote a better mutual acquaintance among Canadian foresters, and to take such steps as may appear to be advisable for the object of promoting in Canada the interests of the forestry profession as a whole. The incorporators are Dr. B. E. Fernow, Dean of the Faculty of Forestry of Toronto University, Robt. H. Campbell and Clyde Leavitt, of Ottawa, Elwood Wilson, of Grand Mere, Que., G. C. Piche of Quebec, Que., Norman McK. Ross, of Indian Head, Sask., and H. R. MacMillan, of Victoria, B.C.

The generosity of W. J. Gage, head of the firm of W. J. Gage and Co., manufacturing stationers of Toronto, and the Kinleith Paper Co. of St. Catharines, Ont., who is a widely known philanthropist, is again evidenced by his offer to the Department of Militia and Defence, Ottawa, of an armored biplane, which will cost ten thousand dollars. Mr. Gage expresses the hope that the biplane, which is for service at the front, will be manned by Canadians. He suggests that many other business men throughout the country might be glad to support the formation of a Canadian air squadron, which would add greatly to the fighting strength of the Dominion.

The Specialty Paper Bag Co., Limited, with headquarters in Ottawa, and a capital stock of $100,000, has been granted a charter. The company will manufacture paper, cotton, jute and all other kinds of bags, containers, packages, etc., and among other powers conferred are those of printing, lithographing, stereotyping and engraving. The incorporators are I. W. Smith, G. M. Malone, Albert Mearns, F. L. Whatley and Peter Russell, all of Toronto.

The Pacific Burt Co., Toronto, have declared their regular quarterly dividend of one and three-quarter per cent on the preferred stock, and one and one half per cent on the common stock. The directors report a very good year, with the volume of business a little better than in 1914. The F. N. Burt Co., Toronto, have also declared a dividend of one and three-quarter per cent on the preferred stock, and one per cent on the common stock.

Albert Grigg, M.P.P. for Algoma, Ont., has been appointed Deputy Minister of Lands and Forests for the Province of Ontario, in succession to the late Aubrey White, and will enter upon his new duties next week. Mr. Grigg is a former Mayor of Bruce Mines, and a pioneer in the Algoma district, having filled many public positions. He was first elected to the Legislature of Ontario in 1908, and has been re-elected on two subsequent occasions.

A conference was recently held with Hon. W. H. Hearst, Premier of Ontario, by Sir Adam Beck, Hon. I. B. Lucas, and W. K. McNaught, members of the Provincial Hydro Commission, with reference to power development at Niagara Falls. The proposed additional development is in the neighborhood of 100,000 horse power. No definite action has yet been taken in the matter.

The marriage of Miss Meta Gibson, daughter of Sir John Gibson, of Hamilton, former Lieut.-Governor of Ontario, and Robert S. Waldie, President of the Toronto Paper Manufacturing Co., Toronto, will take place very quietly in Hamilton on October 16. Mr. and Mrs. Waldie will take up their residence in Toronto.

Ashloo Timber Co., Limited, has been incorporated with a share capital of $200,000, and headquarters in Toronto, to own and operate timber licenses, leases and limits, and to construct and operate mills for the cutting and finishing of logs and lumber. Among the incorporators are Robert J. Law and Fred H. Barlow.

Five thousand dollars worth of lumber was burned when A. Wiley's sawmill at Shipman, N.B., was destroyed by fire.

The British Columbia forest department is asking for tenders for the purchase of a number of timber licenses.

British Columbia is exporting large quantities of lumber to Great Britain. The Fraser Mills alone shipped 8,000,000 feet last month.

In the United States 150,000 children are enrolled in the bird study classes of the Audubon Society for the protection of birds.

The State of Massachusetts has appropriated $90,000 for the purchase of waste lands and their re-forestation. The work of planting of the areas so acquired will be under the direction of the State Forester.

Negotiations are under way for the purchase of a site at Haileybury for a big pulp mill.

The new plant of the Canadian Pulp & Lumber Company, at Lachford, Ont., began operations a few days ago.

The SS. Cranby sailed from Botwood the end of September, with 4,100 tons of paper and pulp shipped by the Anglo-Newfoundland Dev. Co.

It has been found that the ash of the seaweed collected on the shore of Manila Bay in Tondo yields 15 per cent of potash. An abundant amount of the seaweed, it is asserted, is available.

"The trade paper has made giant strides. Its intimacy and strength with its subscribers and contributors are remarkable. But its greatest achievement is the creation of a bond of sympathy, mutuality and understanding between its subscribers and advertisers that is unique. And we do business with our friends; our enemies will not trade with us, anyway."
Elbert Hubbard.

The sulphate process in Canada now accounts for 11½ per cent of the total pulp produced.

The Indiaman states that it has received a report that the construction of six new jute mills is soon to be proceeded with.

The Markets

CANADIAN MARKETS

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.90 to $1.95 at mill, in carload lots.
News (sheets), $1.95 to $2.05 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite (unbleached), $40 to $44, del. in Canada.
Sulphite (unbleached), $40 to $46, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, 85c.
No. 2 book stock, 40c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.20.
No. 1 print Manilas, 75c.
Folded News, 35c.
Over issues, 45c.
No. 1 cleaned mixed paper, 32½c.
Old white cotton, $2.12½.
No. 1 white shirt cuttings, $4.50.
Black overall cuttings, $1.50.
Thirds, blues, $1.25.
Black linings, $1.50.
New light flannelettes, $4.25.
Ordinary satinets, $1.05.
Flock, $1.15.
Tailor rags, .95c.
Blue overall cuttings, $3.37½.
Manila rope, 2½.
N. 1 burlap bagging, $1.10.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45. to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKETS.

Conditions in ground wood pulp continue rather dormant. There is little demand on grinders for stock and there is practically no inquiry from the domestic paper mills. The fact is that as long as water supplies are as favorable as they are at the present time, there is but little future for this market. Paper mills are still able to operate their grinding machines and produce their own ground wood pulp. This condition has been prevailing for a number of months, during which time it has been possible for the paper manufacturers to set aside a considerable reserve supply which will enable them to remain out of the market for some time. The inquiry from abroad is still fairly strong but the shipping conditions have been realized in this respect.

Chemical pulps have attained an extraordinary degree of firmness, and are tending more and more to advance. The market at present is alive with inquiry for it seems that consumers are becoming aware of the acuteness of the situation in this commodity and are endeavoring to secure stocks. While the demand has not as yet become urgent enough to make

the situation really felt, importers agree that it is actually critical. Up to the present time many of the paper mills who operate sulphite plants have found it possible, owing to dull business, to sell part of their pulp output. Through this source and through the domestic and Canadian manufacturers of pulp, paper men have been able to get enough stock for immediate use. Now, however, with business in general improving and with the need for larger quantities of stock becoming more imperative, it is most likely that those mills which have their own sulphite, will find it necessary to use their entire pulp production. Most of the large domestic producers report that they are practically sold out for the current year. So far as contracting for pulp from Norway or Sweden for the next four or five months, absolutely no encouragement has been received. The pulp which is now being imported is entirely on old contracts and is going directly into consumption. The stocks on our docks have dwindled down considerably and are practically not sufficient to be considered of any moment in the market. Conditions abroad have not been changed. If anything, they have become decidedly more precarious. Advices refer continually to labor troubles and to many difficulties in manufacture to say nothing of the obstacles which must be overcome in order to obtain even small quantities of raw materials. The coal question is still one which is to be reckoned. Sulphite and rosin and bleaching powder and many of the other essentials for pulp making are said to be somewhat scarce abroad and efforts to relieve this situation have been only partially successful. Just how the lumber situation is, has not been exactly ascertained, but certain reports have been received which seem to indicate that pulp wood is not plentiful. The effects of all these things on the domestic market has been egregious. Prices have been advancing. There seems to be just one question in mind and that is how high will they go. Unbleached sulphite is being sought with great eagerness but only limited quantities can be obtained. Bleached sulphite is very scarce and it is uncertain just how much can be obtained from Scandinavia even on old contracts. There is a decided shortgage of krafts and pulps. The inquiry, however, is very active. Sulphates are in good demand and are high in price.

The rag market has made remarkable strides within the past week and now seems to be shaping itself to the point where stock will be sold at prohibitive figures. There is a general scarcity of rags in this country at the present time. During the summer, prices had been so very low that there was no inducement for collectors to continue in their work. Just now writing mills are increasing their capacities and are in need of rags. As a result the inquiry in this market has been greatly improved, and conditions have become very firm. Our rag imports have fallen off tremendously and there is very little encouragement for any future supplies from abroad. The seriousness of this situation can be realized only when it is known that we practically depend upon our foreign supplies to cover a large deficit which cannot be met by the domestic collections. Roofing stock has been very active for the past few months and is now in more urgent demand than it has been during this entire period. Prices have gone up. It has even been necessary to use several grades of rags with the roofing stock in order to try to meet the demand. Bagging has been growing firmer and more active. The fact that supplies in this country are not over abundant has been instrumental in forcing quotation up. Domestic gunny is selling at 1.80 to 2c; foreign gunny is quoted at 1.90 to 2.12½c; bright bagging is quoted at 1.50 to 1.75c; sound bagging is quoted at 1.30 to 1.35c; mixed bagging at 1.05 ot 1.15c. Manila rope is in great demand, and is going at 2.90 to 3c. Old waste papers have eased up within the past week. The demand which was splendid has vanished as if over night. Shavings are in poor demand and so are ledgers and practically all grades of flat stock. Manilas and krafts and mixed papers are moving fairly well, although prices have somewhat weakened.

The paper market has been showing to decidedly good advantage during the past month. September has been reported by jobbers and manufacturers as a whole to have been the best month during the past year. The demand for all grades has improved satisfactorily and there is every indication that such improvement will continue for some time. Prices in some lines have advanced and in others similar action is expected soon. The increase in costs of pulps and rags and the various paper makers chemicals are producing much effect in the quotations for paper. The dye situation remains unchanged and experts are able to make no promises whatsoever. The fact is that they state that unless a proper tariff is legislated, it will be impossible to secure sufficient aniline dyes until after the war is over. A number of manufacturers have already advanced their prices on colored papers. Newsprint is firm and is in good demand. A large number of contracts are made during this month which lends considerable work to this market. Tissues have been getting stronger, and are now in fairly good demand. Manufacturers are anticipating getting higher prices for this product. Manilas are brisk at advanced prices. Mills in this line report operating with six weeks' orders on hand. Fibres are in good demand and are selling at higher prices. Krafts have become a little more active. Book papers are fairly brisk, although prices have not improved to any great extent. Boards are in good demand and are selling at higher prices. Bags are quiet but indications are that they will resume activity in a very short time.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.90c to 2.25c., delivered.
Bleached Sulphite, domestic, 2.80c to 3c., delivered.
Bleached Sulphite, impt., 2.70c to 3.15c., ex-dock, N.Y.
Easy Bleaching, impt., 2.25c to 2.45c. ex-dock, N.Y.
Unbleached Sulphate, impt., 1.85c to 2.05c., ex-dock, N.Y.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 1.95c to 2.00c.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.

Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $24 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $22 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

MORE LOYAL PAPER MAKERS.

Editor, Pulp & Paper Magazine,
45 St. Alexander Street,
Montreal.

Dear Sir,—We notice a very interesting paragraph on the Loyal Paper Makers of Scotland in your issue of October 1. To show that England is not backward in respect to the number of men the Paper Industry has supplied to the forces, we would mention that in this firm nearly 600 men have been called up on reserve or have voluntarily enlisted. We may take this opportunity of asking you to add to your Roll of Honor, J. A. Shelley, 24th Battalion, and J. Mathieson, 42nd Battalion, who left this Branch with the Second Canadian Contingent.

Yours very truly,
JOHN DICKINSON & COMPANY, LIMITED.
Montreal, Oct. 1.

THE WORLD'S TIMBER YARD.

Russia, according to the Paper Maker, will be the world's timber yord of the future, for no less than two-fifths of the Empire is forest land. In European Russia the forests extend over an area of about 345,000,000 acres, of which 214,000,000 acres belong to the State, 88,000,000 acres to individuals, 26,000,000 acres to peasants, and 11,000,000 acres to the Crown, leaving 6,000,000 acres under diverse ownerships. In Asiatic Russia most of the forest land belongs to the State. A conservative estimate puts it at 636,000,000 acres, a low figure when it is remembered that much of the land is as yet unexplored. Thus vast reaches of the timber belt in the Yakutsk Province, bordering on the Arctic, which have never known the foot of civilized man, are roughly reckoned at 90,000,000 acres. The same is true of the vast forest areas in Eastern Siberia. It is safe to say that two-thirds of the timber land in the Russian Empire lies in the Urals and the Pacific. Of the total 636,000,000 acres owned by the State, 238,500,000 acres are being worked directly by the Government, with a yield of about 300,000,000 cubic feet of timber, producing gross receipts of 2,100,000 dollars.

The current issue of the Institute Journal of London (the official organ of the Institute of Journalists) publishes a roll of honour which shows that 1,121 members of the literary staffs of British and overseas newspapers and news agencies, are, or have been, serving with the colours in the war.

A PAPER FAMINE PREDICTED.

The following item has freely appeared in the newspaper press: There is possibility of a paper famine in the autumn in this country, and the prospect is giving newspaper proprietors and other paper users considerable anxiety. The immediate difficulty arises from the lack of supplies of pulp to keep the English paper mills going; but the real cause goes further back than that. The pulp comes from Sweden, and the Swedish merchants are unable to produce it just now in sufficient quantities to supply our demands because they cannot get coal from England to keep their factories going. The price of German coal for Sweden has risen by as much as 400 per cent., and is, in consequence, prohibitive. The outlook in regard to the supply of paper, particularly for newspaper purposes, is, therefore, assuming a very grave aspect. Economy will most certainly have to be practised.—The World Paper Trade Review.

CANADA'S FOREST RESERVES.

According to a report recently issued by the Canadian Government, the total area of the forest reserves of the Dominion in 1914 amounted to 152,935,593 acres, divided among the Provinces as follows:

Province.	Acres.
Quebec	107,997,513
Ontario	14,430,720
Manitoba	2,606,400
Satskatchewan	6,195,705
Alberta	16,813,376
British Columbia (in railway belt)	2,417,638
British Columbia (outside of railway belt)	2,474,241

Besides the areas given for British Columbia, all lands west of the Cascades bearing more than 8,000 feet, board measure, of timber per acre, and all lands east of the Cascades bearing more than 5,000 feet, board measure, of timber per acre, are removed from entry.

WOOD BLOCK PAVING.

"Some valuable and perhaps unexpected data on the comparative value of wood blocks and granite blocks as paving for heavy traffic is now available from the case of Wandsworth bridge, where the southern approach road was paved by the local authority with wood blocks, while the L. C. C. paved the bridge itself with granite. Five years have gone by, during which the stone sets have been relaid, while the wood blocks have received no repairs, and are still in good condition." —London, Eng., Daily News and Leader.

WOOD BLOCK PAVEMENTS.

Creosoted wood block pavements are rapidly becoming recognized as a most satisfactory street paving material. They are noiseless, durable, sanitary, and, if properly treated and laid, are distinctly economical. The failures in the past which have in some cases prejudiced cities against wood blocks have been corrected, so that there is no excuse now for the existence of any wood block pavement which doesn't meet all of the modern requirements of service. The improvements in the methods of treatment and laying are largely the result of organized activity by various association representing either the lumber interests or wood-preserving plants.—Conservation.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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Will Pulp be Made Contraband?

The activity and the research work of German chemists may have an injurious effect upon the Canadian pulp and paper trade.

It was announced a few weeks ago that Germany had discovered a process for the manufacture of explosives from wood fibre. This at once opened up the question of wood pulp being placed on the list of contraband articles and of its export from Canada being forbidden by the authorities. As is well known Canadian business houses are not allowed to ship out of the country certain articles of commerce which are designated as contraband. This is done to prevent commodities useful as war material from reaching the countries with whom we are fighting.

Exceptions have been made in certain cases and it seems reasonable to believe that some such provision will be made in the case of wood pulp, the bulk of which goes to the United States. Canada practically controls the world's supply of nickel yet our nickel is nearly all refined in the United States. After a thorough investigation by the Canadian Government it was decided to allow the export of nickel to continue, certain safeguards and restrictions regarding its reexport having been exacted from the International Nickel Company. Again in the case of wheat being shipped to the United States certificates of destination are required and when furnished there is no interference. It is believed that some such arrangement can be made in the case of wood pulp shipped to the United States.

Canada in normal times exports very little wood pulp to Europe except to Great Britain and France, so that the placing of wood pulp on the contraband list would not affect our trade with that Continent. The case of the United States is different. In the first four months of the present fiscal year we exported $1,634,000 worth of chemical pulp to that country and $867,000 worth of mechanical pulp. It is extremely unlikely that any drastic action will be taken in the case of wood pulp. The pulp and paper industry in Canada is an important one and the authorities would be very loath to do anything to interfere with its legitimate growth and development. On the other hand the safety and well-being of the Empire comes before that of any specific industry and if necessary the country will not hesitate to take drastic action. We however are convinced that no such measures will be taken, that if it is necessary to make wood pulp contraband some satisfactory arrangement will be made as in the case of nickel and wheat.

Save Our Trees

Our Western farmers are realizing that trees are more precious than diamonds and are planting them by the millions. Each year the Governmental Experimental Farm at Indian Head sends out trees by the carload while further supplies are secured from other sources.

In the wind-swept prairies trees are a most valuable asset and every possible encouragement should be given

farmers to plant them. Trees have an economic value everywhere but on the treeless prairies they are doubly valuable. There they act as windbreaks, as shelter for birds and also materially improve the beauty of the landscape.

One of the encouraging signs of the times is the changed attitude of the public towards trees. A generation ago a tree was looked upon as only fit for firewood, to be cut down and removed as quickly as possible. Since then we have come to realize that trees are assets to the country. Their roots act as sponges to hold and regulate the flow of water and also to retain the soil on the hillsides which otherwise would be washed away and only bare rock left behind. Their branches shelter birds which in turn feed upon the insects which destroy the farmers' crops. Trees planted along a highway give welcome shade to passersby and add to the beauty of the landscape. Trees are valuable and beautiful and should be protected in every possible way and their number increased.

Until very recently we have put little value upon trees, in spite of their relative scarcity and their value and beauty. There has been little attempt to preserve them, and they have been remorselessly cut down or mained for trivial reasons to suit the convenience of road making or building. A tree should never be lost if it can be saved, and neither public officials nor private individuals should be allowed to sacrifice or injure them without some well considered and compelling cause.

We need to protect the tree from surgical injuries and from destructive parasites. There is a theory not based on consideration of facts and not backed by scientific opinion, that nature should not be interfered with by measures of tree conservation. Unfortunately for this theory, it leaves out of account the fact that man in this part of the world has interfered and is always interfering with the normal processes of wild nature, and that artificial conditions thus established call for counterbalancing measures. Our interference with drainage in well settled districts is one fact which weakens the pristine health of trees and makes them susceptible to ills the wild tree does not have to deal with. The theory also leaves out of account the destructiveness of nature's own processes, observable in any wild country, and it is no consolation to some owners of a few acres that his few possessions are lost in the sweeping purposes of natural law.

The possessor of a beautiful tree wishes to preserve it regardless of such transcendental considerations, and scientific arboriculture will give him the means of self-protection. At the many universities most creditable forestry departments are in operation, and their services in advice or direct help are always available. But every community should help, developing an enlightened policy of tree protection, and a public opinion which holds the tree to be what in fact is a public possession, of value to every one directly or indirectly, both for its beauty and utility.

Pulp and Paper Exports Increasing

Canadian exports of newsprint, chemical and mechanical pulp have reached new high records indicating that this country is becoming the greatest pulp and paper centre on the continent. For the first four months of the present fiscal year our exports of newsprint amounted to $5,098,000 of which $4,589,000 went to the United States. This output is almost equal to eight months' business in 1913 and surpasses the first eight months of 1912 when the amount exported was valued at $3,110,000.

For the fiscal year 1913-14 our total exports were $8,030,000, for 1914-15 it amounted to $12,600,000 while if the rate for the first four months keeps up for the balance of the fiscal year our exports will be between $15,000,000 and $16,000,000.

Not only has our trade with the United States been increasing steadily but we are also doing a larger business with Great Britain, Australia and other parts of the Empire. Another gratifying feature is that Canadian mills are consuming more pulpwood than was the case a few years ago.

Last year the sixty-six active pulp mills operating in Conada consumed 1,224,000 cords of wood valued at $8,089,000 while only 972,000 cords valued at $6,680,000 were exported. Over 55 per cent of all pulpwood produced in Canada was manufactured here and only 44 per cent exported in the raw or unmanufactured state. A few years ago only one-third of the pulpwood produced in Canada was manufactured here. It is to be hoped that the good work will be kept up and that more and more of our raw materials will be manufactured at home, thereby giving employment to a larger number of workmen.

Forest Fires

For causing forest fires by negligence or otherwise, heavy penalties have been placed upon Quebec settlers during the past few days. Determined to stamp out the great annual losses to standing timber due to settlers, the Quebec Government has vigorously prosecuted numbers of cases at Hull, Lachute and other centres on evidence furnished by the Lower Ottawa Forest Protective Association. The latter body patrols over 12,000 square miles of limits on the Gatineau and Lievre watersheds, and over 85 per cent of their fires every year are from settlers' clearings. Under the Quebec law it is necessary to secure a permit from a fire ranger before burning slash and brush, thus making sure of expert supervision.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON.
WM. SMITH.
WM. DONOHUE.
Corp. EARL J. WILSON.
GEO. ALBERT BROWN.
C. V. PERRY.
Sergt.-Major E. C. MORRIS.
Sapper L. A. SWEEZEY.
JAMES BEGGS.

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WILLIAM NUNN.
WILLIAM SMYLIE.
JACK MOLL.
JOHN SCOTT.

The Bronson Company.

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THOS. B. R. CAMPBELL.
Lieut. KENNETH CAMPBELL.
Lieut. GILDDEN CAMPBELL,

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

J. Ford and Company.

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HARRY HENSHALL.
ERIC FORD.
W. D. FORD.
THOS. B. FORD,

Kinleith Paper Company, Limited.

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GEOFFREY GRAHAM.
BEN ASHFORD.
A. DAVIES.
B. BARNES.

Canada Paper Company.

Lieut. F. C. H. TYRON.

Price Bros. and Co., Limited.

G. C. DRURY.
E. C. CULLING, missing 23rd April.
H. D. POWELL, missing 23rd April.
R. B. BRUCE.
G. ASSELIN.
A. AMY, Jr., killed 31st May.
E. LEDGER.
A. BERNIER.
H. A. MOAT.
J. C. EAGLES.
J. HOOD.
S. HARTLEY.
G. LANE.
R. DONCET.
C. CONLEY.
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E. S. HUBBELL.
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GEORGE MORRISON.
WILLIAM CRAIG.
W. S. GOODEVE.
HARRY FRANCIS.
HERBERT LOVE.
JOHN MOORE.
JEAN DESJARDINS.

MacLeod Pulp Company, Limited, Liverpool, N.S.

Sergt. R. D. BROWN, 1st Clearing Hospital.
SAMUEL MANTHORN.
FARQUHAR McRAE.

Howard Smith Paper Mills, Limited, Montreal.

J. KEELY, 60th Battalion, Valcartier.

Northumberland Pulp Co., Limited, Campbellford, Ont.

EVERETT SWEET, honorably discharged.
ARTHUR LLOYD.
ALEX. HANNA.
ALF. HUTCHINGS.
EVERET COULTER.
WALTER SCOTT.
HERB. PRYKE.
JACK CALLAGHAN.
JACK RAY.

National Paper Company, Limited,

JOHN NEIL, Jr., 24th Battalion, Shorncliffe, England.
WILLIAM ROBERTSON, 60th Battalion, Valcartier.

Provincial Paper Mills Co., Limited.

Barber Division.

A. B. C. HERBERT.
THOS. THEO. NELLE.
HERMAN NELLE.
HENRY W. FRANCIS.
JOHN PEACE.
FRED McCARTNEY.
A. SLEIGHTHOLME.

Montrose Division.

H. HALLAM.
J. HURLEY.
W. TAPP.

F. TROWBRIDGE.
MIKE CORTELLEJA.
CHARLES GASPRE.

St. Lawrence Division.

SANDY BEDFORD.
ERNEST BEDFORD.
EDWARD DEMEREST.
JOE DEMEREST.
ERNEST BROWNELL.
VINCENT EAST.
WILLIAM MANSON.
GERALD MANSON.

Lincoln Paper Mills Company, Ltd., Merritton, Ont.

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HENRY HOOKINGS.
LAWRENCE BRADLEY.
LOUIS O'NEILL.
ERNEST WATSON.

Wayagamack Pulp and Paper Company, Limited, Three Rivers, Que.

R. A. GILLIS, 3rd University Co., McGill Battalion, C. E. F.
J. ADAMS, 5th Royal Highlanders.
F. BARTON SMITH, Royal Engineers, England.
R. A. GILLIES, 3rd University Co., McGill.
R. J. HAMILTON, 73rd Royal Highlanders.

Ritchie and Ramsay, Limited, Toronto, Ont.

JAS. COCHRANE, Jr.

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HENRI PARET.
DONALD RHEAUME.
JANVIER BRISEBOIS.

The Dryden Timber and Power Co., Ltd., Dryden, Ont.

LESLIE V. BISHOP, Corporal Chemists' Corps, Royal Engineers.
A. J. LOCK—"D" Company, 52nd Battalion, C.E.F.
E. H. TOYNE—"D" Company, 52nd Battalion, C.E.F.
Sergt. J. JOHNSON—"D" Company, 52nd Battalion, C.E.F.
LESTER L. LEARMONTH — "D" Company, 14th Battalion, 1st Contingent, C.E.F.
RICHARD CURRIE—2nd Artillery Brigade, C.E.F.

Montreal Paper Company.

A. L. BISHOP—2nd Battalion, 1st Contingent, C.E.F. On firing line since February.

Canadian Leather Board Co., Ltd.

JAMES HARTLEY—2nd Contingent.
WILLIAM HALE—2nd Contingent.

Bathurst Lumber Co., Ltd.

ALEC YOUNG—26th Battalion.
RAYMOND LOZIER—55th Battalion.
ALPHONSE ROBICHAUD—55th Battalion.
MAURICE RIX—55th Battalion.
DON. CRAFT—55th Battalion.
J. L. DOUCETT—55th Battalion.
JAMES COLLINS—55th Battalion.
ANGUS BUCKLEY—55th Battalion.

Foley-Rieger Pulp and Paper Company, Limited.

JOHN THOMAS HENRY—44th Regiment.
JOSEPH COOPER—44th Regiment.
ROBERT E. BARRY, 44th Regiment.
CHARLES BESSEY, 44th Regiment.
GIACOMO PANZINO.

Victoria Paper and Twine Company.

A. S. HASSALL, 39th Battalion.
H. C. DUNNING, 6th Field Company, Canadian Engineering Corps.
COL.-SGT. HAROLD DUNN, 20th Battalion.

Powell River Company.

British.

RICHARD WELCH.
GEORGE WASHINGTON.
D. SUTHERLAND.
E. PEACOCK.
A. F. McBRYER.
ROD McAULAY.
R W. LOMBARD.
THOS. FRASER.
W. D. DOYLE.
J FALCONER.
J. COLE.
G. E. COLE.
T. ALLSWORTH.
JAMES CLAPP.
H. A. CARTER.
WM. STANLEY.
JACK BANHAM.
DAVE WILSHIRE.
A. V. GILLINGHAM.

French.

AUGUST SLOSSA.
J GAGNON.
LEWIS SLOSSA.
ED. BAGHUM.

Russians.

MIKE ZUTZ.
MIKE ZUKOFF.
A. ZORATH.
R. ZOKOFF.
GUS ZOCOFF.
A. VANOFF.
TOM VADIFF.
B. VADIFF.
M. VADIFF.
BORIS URTAEFF.
M. TORCHING.
M. TARIEF.
S. TAGOFF.
M. TAGOFF.
ALEC. SOLOFF.
B SERCOFF.
N. NUMSUROFF.
MAX FIDAROFF.
R. DYEBOEFF.
M. DOEFF.
JAS. CHET.
JOE CARVER.
C. MIKE.
ALEC. KUGOFF.
M. MALIFF.
A. KUBALOFF.
V. KOZOFF.
ALEC. KOOTENZO.
C. KOOBLOFF.
A. KAROFF.
GEO. KAROFF.
J. KAPALF.
M. KANOFF.
JIM KARDIFF.
M. CAROFF.
MIR CAROFF.
J. CADIFF.
J. GOODENOFF.
ALEC. GILOFF.
A. FIDAR.
A. DIGNROFF.
ALEC. DOEFF.
A. CATIEFF.
PETE BAZIEFF.
M. ALICOFF.
G. KAMEROFF.
ALBERT KAMEROFF.
JIM JUBULOFF.
A. MURMEROFF.
I. NUDALOFF.
MIKE HAMEROFF.
M. NODOFF.
MIR NODOFF.
B NODOFF.
M. KANOFF.
A. NADZARAGOFF.
G. GUBIEFF.
A. GOSOFF.
M. GODIFF.
MIKE FRAY.
ALI ELLOFF.
S. DOEFF.
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Belgians.

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Edwin Crabtree and Sons, Limited.

WALTER R. STAFFORD, 42nd Highlanders.

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FRANK DORE.
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G FARIE.
JAMES FLYNN.
L. GAGNE.
A. M. GAMMELL.
THEO. DE GRAMONT.
F. X. DE GRAMONT.
JOHN GREER.
JOS. HIGGINS.
F. HODGES.
M. P. HUBBARD.
SAM IRONS.
F KEELING.
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JACK PENDER.
JACK PULLEN,
H. RATHBONE.
PRINCE ROSARIO.
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Trent River Paper Company, Ltd.

ROSS R. HERMAN, killed in action March 2nd, 1915.

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J. RAE, 38th Battalion.
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CAPT. C. E. READ, Ja., C.A.S.C.
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Q.M.S. C. SCOTT CHOWN, 5th C.M.R.
PTE. HAROLD BATES, C.F.A.
PTE. ROLLAND WILLIS, C.A.S.C.
PTE. JNO. TURNBULL, 42nd Battalion.
PTE. MILTON J. TAYLOR, 14th Battalion (wounded).
PTE. WILFRID ROCHON, 22nd Battalion.
PTE. P. ROBILLARD, 22nd Battalion.
PTE. J. E. JEANOTTE, 22nd Battalion (honorably discharged.)

THE CHARACTERISTICS OF FIBRES

By H. A. MADDOX.

(Written specially for Pulp and Paper Magazine).

The story of papermaking fibres through the microscope is one of the most interesting and instructive branches of paper technology. Considering its importance, it is somewhat surprising that so little microscope work is done by the practical papermaker and the student. Primarily the structure and properties of the fibre are responsible for the character of the ultimate pulp and paper. Doubtless the boiling and beating operations may to a very large and growing extent control the ultimate character of the fibre, but notwithstanding the advances that have been and may yet be made in this direction the fact still remains that the primary character of the individual fibres is rejected in the finished stock. No amount of consideration in the preliminary processes can induce an inferior fibre to yield pulp equal in value to that produced from higher class material. The fibre makes the paper and the manufacturing operations get the best out of it. A close study of the individual fibres helps one to realize the efficiency or otherwise of the processing. Knowing their true character it is by no means a difficult matter in the examination of paper samples to assess not only the proportions and types of fibre therein but also the sort of treatment accorded during the various stages throughout the manufacture.

Therefore we advise, that the papermaking student should train himself particularly in this branch of study. No amount of reading alone will enable one to settle down to the microscope and identify with certainty the species of fibre that are generally to be met with. Experience only can do this, backed up by a study of technical literature dealing with the subject. Long and continuous practise with the instrument is essential before the title of microscope expert can be claimed, so far as papermaking fibres are concerned.

It is our purpose in this and subsequent articles to make the task of fibre identification somewhat lighter to the inexpert by briefly reveiewing and illustrating the reliable characteristics of the principal papermaking fibres. We do not intend to indulge in a scientific discourse treating in detail on the dimensions and physical structure but rather to make an interesting and instructive contribution relative to the more striking features which are readily distinguishable in the fibres under mention.

Dealing with linen, which is probably the most desirable type of fibre for high grade stock. The typical fibre is rounded or polygonal in section, generally the latter shape owing to the fibres growing in branches or filaments. Being tightly pressed together the fibres lose their roundness and assume the hexagonal or polygonal shape. The natural ends of the ultimate fibre are gently tapered, but in the examination of treated fibres it is usually found that they have been severely squeezed and crushed, with the result that the ends are split up into shredded fibrillae. Technically, the character induced by the beating process is termed lamination. A close examination of the linen fibre reveals a narrow channel or canal running in a reguler manner through the centre, lengthwise of the fibre. Technically this is termed the lumen, but the more generally accepted name for it is "canal". The fibre itself is fairly wide in diameter, hence it follows that as the canal is very narrow, the side walls of the fibre must be rather thick. It is very important to note these characteristics carefully for they are a distinct aid toward the correct identification of fibres. On close scrutiny it will be observed that many of the linen

fibres bear peculiar markings. Some of them show creases or cross marking, the result of bending; other show nodes or joints like bamboo, but of course on an infinitesimal scale. The illustration clearly presents one of these nodes with a perfect double cross marking. Chiefly however the illustration is of value

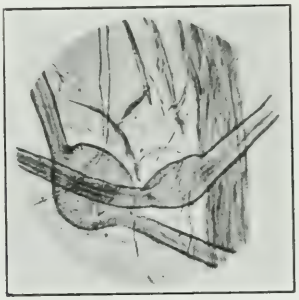

FIG. 1.
Linen Fibres, Showing Bulbs.

for the peculiar bulbs which it contains. Before treatment for papermaking purposes, linen fibres frequently show a number of these complete bulbs. During the breaking and beating processes the bulbs become, burst, split or cut and it is only on rare occasions that they come through the ordeal unscathed. The photo micro. successfully shows complete bulbs, which, taken in conjunction with the canal end cross-marking establishes beyond doubt the identity of the fibre. It

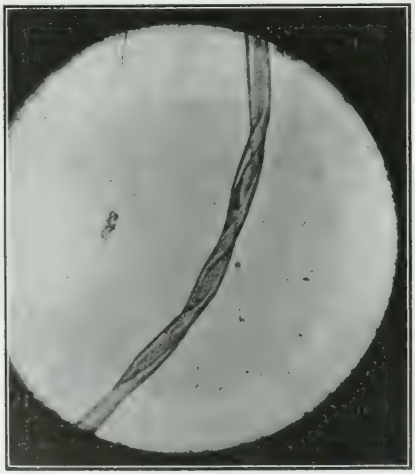

FIG. 2.
Cotton Fibre, showing twists.

must not be understood that the bulb alone is conclusive evidence of the presence of linen fibres for similar characteristics may appear on certain other fibres. Again, air bubbles under the slide may sometimes be mistaken for bulbs by the inexperienced. The bulbs, however, and particularly their distortions, are a good aid in establishing identity.

Considering now the cotton fibre, which has always stood as the prototype of papermaking fibres, we find that it differs very materially from any other type of fibre, save perhaps, certain species of chemical wood fibre. The true cotton fibre under the microscope appears flat and ribbon like, with rounded side-walls and a conspicuous canal. Obversely to the linen fibre, the lumen being large, the side-walls are relatively thin. During growth, while the nutriment is passing through the fibres, the latter are naturally round, and occurring singly, they are not subjected to the pressure which filaments must sustain, hence in section they do not attain the polygonal shape peculiar to linen and other filament fibres. Taken from the plant however, they endure the drying process which causes the individual fibres to collapse on their axis and assume the aforementioned flattened shape. If we imagine a piece of thin valve tubing to be sealed at one end the air sucked through at the other end, we will obtain a fairly accurate idea of the collapsing of the cotton

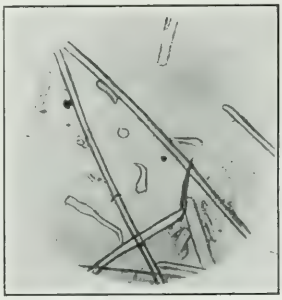

FIG. 3,
Showing Esparto fibres accompanied by seed hairs and serrated epidermal cells.

fibre. Further than this, it may be noted that the tube assumes a few twists in the course of its length. This also represents a conspicuous feature of the cotton fibre, for each single fibre usually presents quite a number of complete twists. The photo-micro. illustration taken under high power shows very clearly three such twists in close succession along an infinitesimal space. The canal and its marking are also quite distinct, while the relative widths of the canal and side-walls combine to make up a rather good study of the fibre. The sunken area between the rounded sides often exhibits slight cross markings or striations and in the photograph the latter characteristic may be duly observed. The ultimate cotton fibre, like that from linen is very long in comparison to other fibres, therefore a certain amount of mutilation and distortion must be allowed for in the beating process, particularly when the latter is prolonged as in the case of special papers, such as thin banks, bonds, typewritings and copying papers. It is often very difficult, even with the aid of colouring solutions to positively identify well beaten cotton fibres from linen. The student must therefore become well acquainted with the various microscopic features of each fibre in order to

readily detect the characteristics peculiar to each separate fibre.

Having briefly surveyed linen and cotton we now come to Esparto fibre a type of raw material probably more highly esteemed in England than elsewhere. Under the microscope the typical esparto fibre appears as a thin, smooth short fibre. In section it is seen to be almost round with a very narrow central canal. The canal is visible up the length of the fibre and it runs along very regularly. Although so narrow, the fibre when viewed under high power is seen to exhibit traces of cross markings, somewhat akin to those of the linen fibre, though by no means so distinct. If the reproduction of our photo-micrograph is successful, the cross markings on the fibres will be plainly visible. The ends of esparto fibres may be either blunt or tapered, more generally the latter and occasionally bifurcated ends are to be observed. In a microscopic investigation however, the decisive proof of the presence of esparto is not so frequently sought for in the fibres as among the cells. In both straw

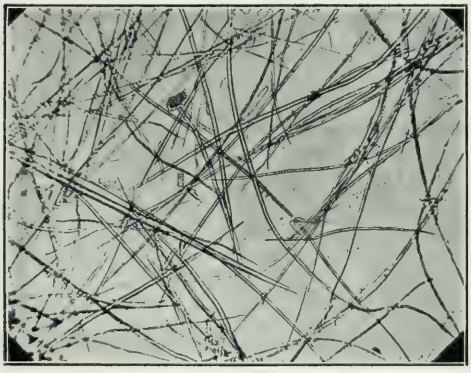

FIG. 4.
Esparto pulp, showing fibres, pecir cells and long and short serrated cells.

and esparto we come across a number of types of cells and other characteristics, some general to both, others peculiar to one or the other. The typical and distinctive esparto cell is a minute seedhair, shaped like a comma or a pear. In the accompanying illustration two very fine examples will be noted near the middle of the picture. These cells in the natural plant are invisible hairs sitting on the stem and in the manufacture of esparto to pulp, although no use to the process, a large number of the hairs find their way through to the finished paper. Although absolutely peculiar to esparto, the finding of a solitary pear cell must not be too hurriedly accepted as proof of the identity of a sample of paper, for it is obviously possible for a few of the minute cells to remain at the bottom or on the sides of the engine after an esparto furnish has been removed. Taken in connection with the fibre and the presence of serrated cuticular cells however the establishment of identity is by no means a difficult matter. The serrated cuticular or epidermal cells here mentioned are common to both straw and esparto, although they may differ somewhat in size and shape. Several are to be observed in the illustration, typified by corrugated or toothed edges and a shorter or longer oblong shape. The hollow interior is usually granulated.

One point about esparto fibres which helps in identification, is the fact that being so short and narrow, they usually escape mutilation by the beater knives and thus appear fairly typical under the microscope. Again, apart from being themselves so small, they are usually selected for grades of stock which are treated fairly free, as in the case of body stock for chromo's and coated arts, soft-sized litho's and mill finished printings. Therefore the student may always look with some certainty to coming across very representative fibres which could not very well be confused with these from other material, provided that some idea of relative proportions was held. As a fitting conclusion to this first paper we may usefully append the following table of average dimensions of ultimate fibres.

	Length m.m.	Breadth m.m.
Cotton	30	.025
Linen	25	.020
Jute	2.5	022
Esparto	1.5	.012
Straw	1.5	.015
Wood (coniferous)	3	.030
Wood (deciduous)	1	.020
Manilla	7	.020
China Grass	22	.050
Adansonia	12	.020
Bamboo	4	.015
Sugar Cane (bagasse)	3	.015
Banana	5	.030
Paper Mulberry	12	.025

The Print Paper Situation in Japan

The European war has dealt a remarkable blow to the trade in print paper. Those varieties which have been supplied from Germany have risen in price 60 or 70 per cent over those ruling about the beginning of the year and by 100 per cent over those ruling prior to the war. Wrapping papers are scarce, the imported supply being nearly exhausted. The Fuji paper mill, the Ojo paper mill, and the Yokkaichi paper mill are, therefore, making a substitute, but owing to the increase in the price of dyce the enterprise is lucrative, despite the growing demand for the home-made papers.

The demand has decreased for print papers to some extent immediately after the outbreak of the war, but since the end of the period of national mourning it had again become strong, and prices have gone up by about 30 per-cent. Pulp for news-print is ratehr scare, and the price of paper has risen by about 40 or 50 per cent. Owing to the rise in freight, import is not profitable at present, and the Mitsui Bussan Kaisha has recently commenced pulp manufacture in Saghalien, but the enterprise has not yet proved successmul. As to Japanese papers both "hanshi" and "minogami" have increased in price by about 15 per cent, probably because of the rise in foreign printing papers. The demand for these varieties has undergone no change, but there are many orders at present, as it is the season for the largest consumption. Of these varieties, the coloured ones have risen in price because of the rise in the price of dyes.—(Japan Advertiser).

CHESTNUT AS A PULP WOOD

By P. L. BUTTRICK.

Special to Pulp and Paper Magazine.

Considered by bulk, the consumption of chestnut for pulp in the United States is small, and in Canada probably nil. Yet there are at least two plants in the Appalachian mountain region of the United States where it is used on a considerable scale. One of these plants uses from 150 to 200 long cords of chestnut wood per day.

Process of Manufacture

The process used in the manufacture of chestnut pulp is namd from its inventor, Omar Carr, being called the "Carr Process." It is a modification of the soda process. Chestnut wood is rich in tannic acid — to such an extent that unless it is first extracted from the chips, it soon eats out the linings of the digesters. Consequently the acid is first leached out of the chips with hot water in wooden or copper tanks. The chips then go to the digesters and are treated in the ordinary way. The tannic acid is a very valuable by-product and is in demand at tanneries where it is used in the manufacture of leather. It is shipped in standard solutions in tank cars, or as a solid in bags.

Method of Stocking the Mills.

The pulp companies of the South, particularly those in the Appalachian region do not generally own timber lands or conduct logging operations, but depend upon purchases made from dealers or contractors, usually for small amounts. The wood itself is very largely gotten out by farmers, a few cords at a time, and delivered to dealers, agents or contractors along the railroads, where it is loaded and shipped to the mills. Sometimes flumes are used to transport the wood from the mountain slopes down to the railroads. Some of these flumes are more than 15 miles long. River driving is not resorted to. It was tried a number of years ago with sawlogs, but did not prove successful. There have been one or two regular operations on a small scale to supply chestnut pulp and acid wood, chiefly from old lumber cuttings, and some lumber operators work up their tops, hollow butts and inferior trees into pulp and acid wood stock. A small amount of chestnut sawmill waste is also used, but most of this goes to the plants which make only tannic acid.

On the whole, probably 90 per cent of the material handled by the mills is brought in by farmers. In certain sections and at certain times of year it is one of their chief occupations and their chief source of revenue.

It is not probable that a company would gain much by undertaking logging to stock its own mill, since the supply of wood brought in by the farmers seems adequate and they are satisfied with a much smaller profit per cord than would be demanded by men working for a company by the day. The long cord, consisting of 160 cubic feet of 5-foot wood, is the standard unit for chestnut pulp and acid wood.

Cost of Wood and Manufacture.

Following are the prices current before the outbreak of the War for chestnut and other woods delivered at the mill or at specified points along the railroad lines of the region:

Chestnut (peeled	$5.50	per long cord
Chestnut (unpeeled)	4.50	" " "
Hemlock, spruce & balsam..	6.00	" " "
Yellow pine (peeled).....	4.25	" " "
Yellow pine (unpeeled)....	3.50	" " "

These prices vary with the supply on hand, the season of the year, the railroad point and other conditions, but weer averages at the time given.

It is generally estimated that three cords of wood are required to produce a ton of pulp worth, when this study was made $40, with a by-product of about four barrels of tannic acid, worth at the time indicated, about $25.

Technical Value of Chestnut Wood for Pulp ..

The writer of this article is not a paper maker and is unable to speak with authority as to the technical value of chestnut for paper making. It is not a particularly long-fibred wood and is rather dark colored. It seems to be the opinion among paper makers that its manufacture is more expensive for the latter reason since it requires more bleaching. It has been found difficult to extract all the tannic acid in the wood and the residue is said to affect the linings to tanks, pipes, etc. to more or less extent. One factory using much chestnut has, or had, a contract to furnish postal cards to the United States Government and much chestnut pulp has gone into this class of stock. Chestnut also makes excellent book papers.

It seems evident however, that chestnut, authough a fair pulp wood, is not of the highest technical value for paper making and that its desirability must largely rest on some of the other factors which influence the paper maker, such as (1) abundance and accessibility of supply, (2) ease of renewing the supply when the original stock is gone. It is for the second reason that chestnut promises to be of importance.

Supply for Raw Material.

Looked at from the point of view of the supply of raw material, the value of chestnut as a pulp wood might be consired slight compared with such well known and abundant pulp woods as spruce, hemlock and poplar. It is doubhful if there is more than 30,000,000,000 feet of chestnut stumpage in the United States, while the amount in Canada, where it is confined to Southern Ontario, is insignificant. Compare this with the 50,000,000,000 feet of spruce in eastern United States to say nothing of the enormous supply in Canada. Most of the commercial chestnut in the United States is found in the Southern Appalachian Mountains.

Renewing the Supply.

Looked at from the point of view of forest management and the possibility of the easy renewal of the supply, chestnut is in many ways a highly valuable species and one worthy of the attention of the pulp manufacturer. It is very rapid growing and easily

propagated. Spruce and hemlock are slow-growing species at best, and it will generally take about 50 years for them to reach dimensions suitable for pulp, and they can be grown only from seed. Which means planting or the leaving of seed trees in order to secure reproduction. Chestnut, in the other hand, reaches a size sufficient for pulpwood in from 25 to 30 years (little or more than half as long) and sprouts vigorously, so that all that is necessary for its propagation, is reasonable care as to cutting and fire protection. Low stumps are essential and cutting should take place in fall or winter.

But some one has already said "Chestnut Blight". So it might be as well stated here without waiting for the subject to be reached in order of topics, that whatever advantages chestnut may have for pulp its planting and growth for that or, any other purposes is not to be thought of in the region where the blight has attacked it. That is to say, in New England, eastern New York and Pennsylvania, New Jersey, Maryland, Delaware and parts of Virginia and West Virginia.

Growth and Yield of Chestnut.

In order to show what may be expected in the way of growth and yield from chestnut stands in different regions we present the following figures obtained from studies made by the United States Forest Service. The stands dealt with are not plantations, but even-aged sprout stands resulting from clear cuttings. The localities — southern New England and eastern Tennessee — are at practically extreme points of the range of the tree.

Comparison of Rate of Growth of Chestnut and Spruce

No plantations or natural stands of Norway spruce (the European species of spruce almost entirely used in planting operations in this country in place of our slower growing native white or red spruces) have been long enough established to give any indication of their final yields, but the data for table I was collected in Europe and shows what the species is capable of doing there.

TABLE I
YIELD TABLE FOR SPRUCE IN EUROPE.
Cords per acre.

Age	Quality I.	Quality III.	Quality V.
20	8	—	—
30	32	7	—
40	61	23	4
50	86	41	11
60	122	56	29
70	142	69	30
80	149	80	39

While the tables for growth of spruce and chestnut cannot be strictly compared, since in one case 3 qualities of site are recognized while the other 5 are made use of, it is evident that chestnut in America grows faster up to the 50th year than Norway spruce in Europe, and it is not likely that the rate of growth of the latter would be maintained, far less increased, in America. The figures given above for spruce are for carefully managed and frequently thinned stands — methods not likely to be employed in the United States.

Opportunities for Growing Chestnut for Pulp.

If it were not for the chestnut blight it would be perfectly safe to say that almost anywhere chestnut grows in abundance it would be a desirable thing for pulp manufacturers to locate large tracts of chestnut timber and manage them on a short sprout or "coppice" rotation, anywhere say from 20 to 40 years as studies proved the best, and to extend the amount of it by planting, since it is easily handled in the nursery, transplants readily and seeds abundantly. But wherever the blight is established or theatening, such a procedure need hardly be considered. Perhaps in the course of time this destructive disease of the chesnut may disappear or cease to be dangerous, but there is no depending upon this taking place.

Outside the natural range, chestnut is said to do well throughout Missouri, southeastern Iowa, the eastern countries of Nebraska and Kansas and the southern half of Minnesota. But none of these regions are centers of pulp manufacture and it is hardly possible that large commercial plantations would be established in them.

Within the natural range of tree, the Southern Appalachian mountains offer the most attractive field for the production of chestnut pulp wood. Here it seems sheltered from the blight for some years to come at least, grows well and abundantly and reproduces freely.

It seems to the writer that pulp interests would find it a satisfactory investment to buy up chestnut lands in this section and manage them on a short coppice rotation, and to supplement their supplies by the purchase of chestnut wood from sections where the blight or other enemies are destroying the timber and depressing its value. Since there are a number of other species in the Southern Appalachians which are valuable for pulp, even the chestnut did, after a rotation or two, succumb to its enemies, there need be little if any loss on investment.

PAPER HANGINGS FROM CANADA.

In the three years previous to the outbreak of the war, German wall-paper manufacturers sent on an average 42,000 cwts. of paper-hangings each year to the United Kingdom. Even Belgian makers were in evidence in this trade, their exports to this market reaching an average of 12,000 cwts. per annum.

In view of the cessation of these supplies, it would be interesting to learn if Canadian manufacturers might be able to participate in this trade. The prospects for Canadian made wall-paper have at various times been referred to in former issues of the Weekly Bulletin, and should any Canadian firm desire to test the possibilities of doing business in this line they are invited to send samples and price. — Government Bulletin.

CONCRETE TIES.

A Truro N. S. citizen has patented a concrete tie which he expects will put the ordinary wooden tie out of business. The tie is of reinforced concrete, the reinforcement consists of four steel rods running the full length of the concrete, which is the same length, breadth and depth of ordinary wooden sleepers.

When dry it is said they will weigh three hundred pounds each, not much heavier than a green wooden sleeper. The cost of manufacture is estimated at one dollar each, about fifty cents higher than No. 1 wooden ties. The advantage is in the duration. The life of a wooden tie is about six years, that of a concrete one indefinite.

FOREST LANDS IN THE STATE

There are approximately 12,000,000 acres of potential forest lands in New York State.

MAKING THE WORLD'S RAGS INTO VEHICLES OF HUMAN THOUGHT

By JOHN C. KIRKWOOD

in Bookseller and Stationer

Paper is the matted or "felted" fibres of flax, cotton, straw, bark, grass, wood or hemp.

The fibres are the casing or walls of coverings of plant cells, and, in technical language, are called cellulose. As protectors of the cells they enclose they are relatively strong and tough, being stringy and woody in their nature —this when they are freed from all foreign substances. In the manufacture of paper, the object of the paper-maker is to eliminate the glutinous, resinous, siliceous (containing silica) and other inter-cellular matters, and to produce the fibres as pure and strong as possible.

The usefulness of a plant for paper-making depends upon:

The strength and elasticity of the fibres.

The properties of cellular tissue contained in them; and upon:

The ease with which this cellular tissue can be freed from the encrusting and intercellular matters.

Of the processes by which fibres are freed from trees and plants, grass and bark, it is not the intention to say anything here. This is a story by itself. This study is concerned with an enquiry into the processes by which fibres are prepared and "felted" or matted to form paper, with particular application to rag-made papers—"bonds" or "ledgers" and writing papers.

The processes for the manufacture of paper are practically identical for all grades of paper, the same general procedure being followed in the preliminary operations of all paper-making, and the same machinery being employed for the making of fine tissues as are used for the making of stout wrapping stock.

The Best Stock.

Linen rags are used in the manufacture of the finest and strongest papers—the papers generally known as "bond" or "ledger" and "writing" papers. These linen rags are obtained as a rule from shirt factories—they are the waste of these factories—shirt-tails if you will.

Cotton rags are extensively used in paper-making. These are obtained chiefly from factories where overalls are made, being the waste or scrap of these factories. (Denim from which overalls are made is a cotton fabric.)

Other rags used in the making of paper are shoe-clippings ('shoe linings'), and the rags gathered by rag men, and sold to firms dealing in rags.

In the manufacture of coarse papers, including news print, rags are not used, the fibres being obtained directly from wood, hemp, esparto grass and straw. One reason why rags are used is that they represent an advanced stage in the processes of paper-making: that is, the labor of freeing the fibres from the flax or cotton plant has already been performed and all that needs to be done to prepare rags for paper is to restore or resolve the woven fibres once more into free fibres.

Turning Rags Into Fibrous Pulp.

The first operations in the preparation of rags for paper are designed to make them thoroughly clean, to eliminate their color to make them white. If the rag-stock is in large pieces, these are cut up into small pieces of workable size, say not larger than four inches square.

After being passed in bulk through a revolving duster to remove sand, dust, etc., the rags go to a boiler, the objects of this process being to remove dirt and color, and to decompose a particular glutinous substance present in rags, and which, if retained, would impair the flexibility of the fibres, leaving them "harsh" or stiff, and thus interfere with their easy conversion into pulp.

After being boiled in an alkaline solution for from six or twelve hours, the rags are passed on to a "breaker" —a sort of vat or trough in which is considerable machinery. The rag mass is made to circulate in this vat, clean water is turned into the mass to wash it, the dirty water is drained off, and the machinery cuts and "teases out" the rags into original fibres, and brushes them into a uniform direction. This operation takes from two to four hours.

As soon as all signs of the textile nature of the rags are destroyed and the "brushing" process referred to above is completed, a bleaching solution is run in to bring the pulp to the required degree of whiteness. The rags in this pulpy, bleached state are called "half stuff." After draining, this half stuff is stored, being now ready for the next series of operations.

The Beginnings of Paper.

Now begins one of the most important and delicate of all the processes employed in the making of paper: namely the "beating" of the half stuff to reduce the fibres into similar lengths and to beat them into a stiff pulp, having a consistency sufficient to absorb and carry the water necessary to "felt" them together on the wire cloth of the paper machine. Not only does every class of fibre demand its own special treatment, but this treatment has to be modified and varied in each case to suit the qualities and substances of the paper to be made.

The half-stuff is placed into "beaters"—vat-like holders very similar in form to the "breakers" in which the half stuff is prepared. In these beaters is special "beating" machinery, and the contents are kept circulating as in the breakers.

Great skill and care in the manipulation of the pulp are required in this process, which takes from three to twelve hours to complete, according to the nature and quality of the paper to be made.

During the operation of beating, various materials and chemicals are added to the pulp for the purposes

of sizing, "loading," coloring, etc. Papers for writing and most of those for printing purposes must be rendered non-absorbent of ink and other liquids applied to them.

Tub and Engine Sizing.

This non-absorbency feature of paper is secured by the addition of a sizing material, of either vegetable or animal origin, which is either applied to the paper as a top coating, or is mixed in with the pulp during the beating process. In better grades of writing paper both methods of sizing are employed.

When the sizing is done on the beater, the paper is said to be "engine sized." When it is applied as a top coating (at a later stage in the manufacturing process), the paper is said to be "tub sized," since the paper web passes through a trough or tub in which is a very fluid size made of animal glue and alum. The vegetable size used in the beater is a pine sap or resin supplied commercially in the form of solid cakes. The function of this resinous sizing is to fill up the interstices of the fibres. The size when thus mixed in and when dried or heated on the cylinders in subsequent operations possesses the the property of being with difficulty wetted with water.

The Loading of Paper.

Except in the very best qualities of paper it is usual to add to the pulp in the beater a certain amount of cheap "loading" material, such as china clay, or kaolin, or pearl hardening. The addition of such loading to a moderate extent—10 per cent or 15 per cent -is not entirely in the nature of an adulterant, as it serves to close up the pores of the paper, and for ordinary writing, printing and lithographic papers, renders the material softer, enabling it to take a much better and more even surface or glaze. If added to excess, it is detrimental to the strength and hardness of the sheet.

Coloring or Tinting the Paper.

The natural color of fibre inclines towards a yellow tinge, and to produce the required white shade, red and blue dyes in proper amounts are added to the pulp mass in the beater. Similarly with respect to other shades or tints required—azure, pink, grey, golden rod, green, etc. The dyes are aniline (coal tar base) as a rule, but just now, owing to the difficulty of obtaining this class of dye and high prices, there is a tendency to use dyes of vegetables or animal origin. The objection to these dyes is that they do not give fast colors, and so the paper dyed with them may fade. Papermakers under the circumstances are encouraging a more general use of white papers.

From the beater vat, the pulp, now sized, loaded and tinted, is passed into a beating engine, a horizontal cone-shaped vessel in which are revolving or beating mechanisms. Here the pulp is very thoroughly chewed as it were and made into a refined, dry and shredded mass. From this refining engine, the pulp passes into a huge storage vat or "stuff chest," in which revolves a vertical agitator whose function is to keep the pulp mass fairly loose and even in its distribution in the vat.

Making Pulp Into Paper.

From the stuff chest or storage vat the pulp is pumped into a long upright supply box at a higher level, called the stuff box. This box communicates with the sand trap tables. With the pulp a certain amount of water is allowed to flow on to the sand table to dilute it sufficiently to "form" on the wire cloth of the paper-making machine. As its name implies, the purpose of the sand table is to catch or collect any impurities still remaining in the pulp.

From the sand table the diluted pulp passes to the "strainers." These are made of plates of brass or some hard and durable composition with fine parallel slits cut in them through which the fibres pass, all knots and improperly divided particles remaining behind. The pulp is made to pass through the slits by a rapid vibration of the plates themselves, or by a strong suction underneath.

From the strainers, the pulp flows into a long wooden box or trough caleld the "breast box," and thence on to the wire cloth of the paper-making machine. The breast box has the same width as the wire cloth.

Felting the Pulp.

The diluted and strained pulp flowing from the breast box is now delivered to the paper-making machine and spreads itself over a continuous woven wire cloth suported horizontally by small brass rolls, carried on a frame from 40 to 50 feet in length. The ordinary gauge for the wire cloth is 66 meshes to the inch for writings and printings. For lower grade papers the mesh is coarser.

The water mixed with the pulp flows or escapes from the wire cloth by gravity and suction. Thus is formed on the wire cloth a web or mat or felt of saturated pulp which when dried and "finished" is the paper of commerce.

The wet pulp as it flows on the wire cloth from the breast box is confined on the sides by "deckle straps," made of vulcanized rubber. These prevent the overflow sideways of the diluted pulp from the wire cloth bed.

This endles wire cloth, revolving over end-rolls, carries the felted pulp forward, and delivers it to succeeding roller machines, whose function is to flatten out the felt mat and to squeeze out the water remaining therein.

Water-marking the Paper.

Before, however, the felted web passes from the wire cloth machine it is made to receive its "water mark," if the finished paper is to carry one. The water mark is applied by a "dandy" roll—a light skeleton cylinder covered with wire cloth on which small pieces of wire are soldered representing the water mark. The light pressure of this wire mark on the moist web or felt forces apart the pulp, and makes the paper thinner whenever the contact takes place. This explains the greater transparency of the water mark design.

Before the paper leaves the wire cloth machine it passes between what are called "couch rolls" which by pressing out most of the moisture remaining, impart a sufficient consistency to the paper to enable it to leave the wire. These couch rolls are covered with a felt jacket.

The now fully formed paper is carried to other rolls to exhaust remaining moisture and to obliterate as much as possible the impression of the wire cloth from the under side of the web.

Dry the Paper.

The web is finally dried by passing it over a series of hollow steam-heated cylinders. The slower and more

gradual the drying process, the better, as the change on the fibres of the web, due to rapid contraction, is therefore not excessive, and the heat required at one time is not so great and not so likely to damage the quality of the paper.

The drying cylinders are generally divided into two sets, between which is placed a pair of highly polished chilled steel rollers heated by steam, called "smoothers," the purpose of which is to flatten or smooth the surface while it is in a partially dry condition.

Tub-Sizing.

If the paper is to be "tub-sized"—and nearly all high-grade bonds or ledgers and writing papers are tub-sized, it is, immediately upon being reeled off the last of the drying cylinders, led slowly through a trough containing a heated solution of animal glue or gelatine mixed with a certain amount of alum. Thus it is coated on both sides. This coating, as has been previously noted, is designed to render the paper non-absorbent of inks and other fluids. It is this sizing, hard in its nature, which enables erasures to be made without disturbing the fibrous body of the paper.

After passing through a pair of brass rolls to squeeze out superflous size, the web is reeled, and allowed to remain for some time for the size to set.

The final processes consist of "calendering" the paper, of cutting it up into standard sizes, counting it into reams, and wrapping and packing ready for shipment.

The calendering process is passing the paper between highly polished rolls, which puts a gloss on the paper's surface. If no gloss is required the calendering process is omitted.

Linen and Crash Finishes.

An interesting process is the giving of specific finishes—linen or crash for example—to certain papers. This is done after the paper is cut into standard sizes. Between individual sheets is placed a sheet of linen or crash of equal size. Then when a quantity of these alternating sheets is made ready, they are placed in a press with zinc-surfaced top and bottom, and pressure is applied. When the paper sheets are removed, they are embossed with the designs of the linen or crash textures.

This concludes the story of making paper by machinery. It is worth while, however, to take time to say a few words on the making of hand made papers.

Hand-made Papers.

Only the finest qualities of rag pulp are converted into paper by the hand process. As may be conjectured, the hand process is slow a week being required to do what can be accomplished in a day by machinery. At the same time qualities and effects can be obtained in hand-made papers not ordinarily possible when machinery is wholly used. Also, there are to be taken into consideration the sentimental or fastidious inclinations of the connoisseur.

The pulp is prepared in exactly the same way as in the case of machine-made papers. The point of departure occurs at the "stuff chest" stage.

The hand-made sheet, which obviously is of limited dimensions, and not a continuous web, as in the case of machine made stock, is made on a mould of fine wire cloth held in a frame. This frame is designed to keep the pulp from running off, and extends slightly above the surface of the mould. It is called the "deckle."

To form the sheet the paper-maker dips the mould into a vat, lifting up just enough to make a sheet of required thickness. The water drains off, leaving the fibres in the cloth in a coherent sheet, the "felting" or intertwining being assisted by lateral motion. The movable deckle is then taken off, and the mould given to another workman, called the "coucher" who turns it over and presses it against a felt, and by this means transfering or "coushing" the sheet from the wire to the felt. After a number of sheets have been thus formed, with felt in between, they are subjected to strong pressure to expel water. The felts are removed, the sheets are again pressed and dried, and are now read for sizing.

If a pattern or name is required on the sheet, it is obtained by making the wire cloth in such a way that it is slightly raised to form the name or mark desired. The consequence is that less pulp body is there and the paper is thinner.

Hand-made paper is usually "loft" or "pole" dried. By this is meant that the sheets are suspended in lofts or on poles and allowed to dry atmospherically. Drying in this way permits a free and natural expansion and contraction of the sheet, and is non-destructive of fibre formation of life.

The Papers of Commerce.

Regarding the commercial classifications of papers, the following groupings adopted by the United States Census Commission in 1900, are given:

1. News—rolls and sheets.
2. Book—including cover, plate, lithographic, map, woodcut, cardboard, bristol.
3. Fine—including writings and ledgers (bonds).
4. Wrapping—Manilas (rope or jute or hemp.)
5. Straw.
6. Bogus Manila—(wood fibre).
7. Boards—binders' board (for book-binding), pulp board, straw board, news board (made from old newspapers).
8. Miscellaneous—tissues, blotting, building roofing, carpet-lining, hanging (wall).

The Testing of Paper.

In his testing of bond or ledger papers, one expert paper manufacturer submits them to the following trials:

1. Tears the sheet in such a way that it has a feathery edge. By this means he discovers the length of the fibres, and if they are closely knit. If the fibres are close-knit they will not separate easily. This means a strong sheet—one that will stand much handling.

2. "Tongues" the sheet; that is, pats the sheet against his tongue, to ascertain whether it is well sized. If not well sized the saliva will penetrate into the sheet. This would be a defect.

3. Examines the sheet for cleanliness (freedom from specks) by holding it up to the light. Specks get into the pulp from the rolls, from the pipes through which the pulp is passed (inside scaling), and as a result of unscreened windows or a dusty factory. Specks are a common blemish.

4. Examines the formation of the sheet (by holding it up to the light). Good formation is indicated by an absence of a blotchy or mottled body, by a uniformity of texture. A mottled sheet indicates that the pulp is not properly "beaten," or has a faulty formation on the wire cloth.

5. Examines the surface of the sheet by feeling it and by glancing across it held horizontally before the eye. If the sheet shows rough patches it indicates a fault in finishing; the rollers through which the paper was passed have not perfect contact with each other, and so do not "lay" on the sheet uniformly, thus leaving unfinished or unsmoothed surfaces.

The Essentials of Good Paper.

In concluding this short account of the making of paper it is interesting to record that a sheet of paper made from the newer and cheaper vegetable fibres differs little as a fabric from papers of the earliest epochs. But in the durability and tensile strength of papers of various kinds there are great differences. The longer and rougher the fibres, the stronger the paper. When the fibres are short and smooth the paper is apt to be brittle and easily torn. Also the fibres of some plants are better than others, the fibres of flax (linen) being the best of all.

Canada as a Paper-Maker.

In the making of fine papers, as well as in other varieties of paper, Canada is fast becoming a competitor of all other countries. In the matter of her ability to make papers of the first grade she is not behind the paper-makers of other countries. If Canada suffers any handicap, it relates to the smallness of her consumption as compared with other more populous countries—the United States, Great Britain, France and Austria-Hungary, which with Canada, Belgium, Holland and Scandinavia, are the great paper-making countries of the world.

It has been observed that there is a striking relation between human intelligence and the progress of civilization and the quantity of papers consumed. Recent events lead one to question the absolute correctness of such a conclusion, yet it is comforting to reflect that Canada is a great newspaper country, a large producer of printed matter of all kinds, and that Canadians have been declared to be the greatest book-reading nation in the British Empire.

LESSENING FIRE RISKS

"The veteran Ottawa lumberman, Mr. J. R. Booth, has caused the piling ready for burning at a safe time, of inflammable debris on a narrow strip of his limits parallel to a portion of the Canadian Northern Ontario railway, east of North Bay. This progressive action in connection with forest fire prevention will materially reduce the fire hazard to valuable timber lands in the vicinity. Similar action by other limit-holders would undoubtedly be a paying investment. —C. L. in Conservation.

GOOD CROPS HELP B. C. LUMBERMEN

"On account of holding so much grain themselves the farmers are demanding lumber for granaries, and are placing large orders. Consequently the B. C. lumber industry should reflect correspondingly with the prairie farmers' prosperity", says J. A. Cunningham president of the B. C. Manufacturers' Association in an interview following a visit to the Prairies.

The Brompton Pulp and Paper Company, of East Angus, Que., have opened an office in Toronto at 505 C. P. R. Building, with R. H. Bryan in charge.

Canadian "News" Mills

The World's Paper Trade Review.

We have previously referred to the proposal on the part of Canadian exporting "news" mills to come to some selling arrangement to eliminate competition and reduce marketing expenses, and we now learn that a scheme has been practically completed.

It is reported that the mills have been divided into two groups — western and eastern. Those in the western group are the Spanish River Pulp and Paper Mills and the Abitibi Power and Paper Co., and those in the eastern are the Laurentide Co., Canada Paper Co., J. R. Booth and the Brompton Pulp and Paper Co.

The sales of the Spanish River Pulp and Paper Mills and the Abitibi Power and Paper Co., who now have three machines running, turning out about 120 tons a day; and who expect this month to put the fourth machine in operation, are, it is understood, being looked after by George H. Mead and John G. Sutherland, of Dayton, Ohio. The interests of the eastern group will be attended to as far as American business is concerned by H. G. Craig and Co., of New York City. It is announced that the output of the Abitibi Power and Paper Co. will all be exported, and that no difficulty in marketing the production has so far been encountered. The Belgo-Canadian Pulp and Paper Co. and Price Brothers and Co. are not included in the merged selling interests.

An important change has just taken place on the sales staff of the latter company. J. T. Mix, who for the last three years has looked after the disposition of the products of the Lake Superior Division of the Spanish River Pulp and Paper Mills, has joined the staff of Price Brothers and Co. as sales manager of their news-print department, and will have offices in New York City.

William Robinson, who was lately with Price Brothers and Co., has taken a position on the staff of the Laurentide Company.

The output of the news-print by the Spanish River Pulp and Paper Co., with their three plants at Espanola, Sault Ste. Marie and Sturgeon Falls, Ont., is about 450 tons a day, and the Abitibi Power and Paper Co. at their new plant at Iroquois Falls, Ont., when in complete operation, will produce about 225, making in all some 675 tons.

In the eastern group of the mill of J. R. Booth at Ottawa has an ouptput of 120 tons daily; that of the Canada Paper Co. at Windsor Mills, Que., 40 tons; Laurentide Co., at Grand Mère, Que., 200 tons, and the Brompton Pulp and Paper Co. at East Angus, Que., 60 tons, aggregating in the daily capacity 420 tons. Thus about 1,100 tons of news-print will be available each day for export by the plants in the eastern and western group, which is over half the total daily production in the Dominion.

IT "BEATS THE DUTCH".

The war in Europe has had a tremendously unfavorable effect on the pulp and paper industry of the Netherlands, no such stagnation in business as is felt at present having been recorded in the 300 years of its existence. The reason is that not only is neutrality strictly observed in Holland, which has greatly reduced work in the paper mills, but great difficulty is experienced in obtaining raw materials.

Labrador

Its Forest Wealth, and Stupendous Water Powers.

Labrador, a vast peninsula, encompassing five hundred thousand square miles, is the least known portion of North America. Its precise boundaries are still undefined. Part belongs to Canada and part to Newfoundland, but so widely have the lines of demarcation, as traced by these respective governments differed in their respective claims that thousands of square miles being involved, a tribunal of arbitration is awaited. The precedent for Newfoundland's claim dates from the Treaty of Paris, 1763, this treaty decreed her's, all that area and watershed drained by rivers and tributaries emptying into the Atlantic, beginning at Blanc Sablon, in Strait of Belle Isle, to 52 deg. parallel, from that parallel to the River St. John, and thence to Hudson Bay. The world has known it as a great cod fish depot, but of its greater potential wealth, its forest and stream, of which I will write, the world is comparatively ignorant.

Newfoundland's timber areas being all acquired a few years ago, necessity compelled that new soures of supply be found. Lumbermen, cruisers and surveyors travelling inland in Labrador, then found the mighty quarry of these virgin growths. It is in the smaller growth of trees that these Labradorian forests are valuable. Climatic conditions and certain paucity of soil regulate the height to from 40 to 50 feet, and diameter from 6 to 10 inches, though trees of an altitude from 8 0to 90 feet and larger girth are not rare. It is the density of growth, however, which surpasses that of every other timber area in America, that consists the forest wealth of Labrador. The trees grow so thickly that hundreds of miles of forest land stretch literally impenetrable.

The policy of the different governments relative to these timber limits has been a negative one. The sole statute in this respect prevented exportation of unmanufactured woods from Labrador. That enactment primarily intended to conserve these resources has resulted in the excessive growth which cannot but be harmful. Generation after generation have sprung up matured, and then burned, fell, or decayed unprofitless. Here and there patches of primeval forest still stand with trees of enormous proportions. The present government last September very wisely repealed the law prohibiting exportation of unsawn timber pro tem, while the war would last, but at the present Legislature the law permitting exportation for 10 years is being enacted.

Labrador forests consist of spruce mainly, with fir, Juniper, white and yellow birch. The percentage composition is calculated to be 90 per cent spruce, 5 per cent fir, remainder of various growths, which shows the adaptability for pulp these forests are. The opinion prevails that for firmness of fibre and growth, and tensile strength the spruce of Labrador is unequalled. The percentage decadent timber among standing trees is remarkably small. It is a fact that timber sawn over forty years ago, and used for walks to dwellings at many of the stations in Labrador exposed, unpainted to the forces of the atmosphere, still retain a perfect state of preservation.

Though these forests are peculiarly adapted to pulp and pit wood supplies, very profitable saw mills could be operated. There are many excellent timber limits, where largest saw mills could be profitably operated. Some of the best spruce deals ever landed in England were products of the Dickie timber mills, located at Hamilton Inlet. The cargoes averaged 3 x 11, and 3 x 9 inches. But the greatest commercial value of these forests will be in the millions of cords of pulp and pit wood they will supply. Someone has estimated that these forests could supply the United Kingdom with pit wood for one hundred years, and not only then not be depleted, but much better, because of the good that would accrue the thinning out. Several cargoes of pit wood have been marketed in England already, which very probably is the nucleus of a great industry. Approaching Labrador, one is not favourably struck by the monotonous, barren sea coast, it is treeless; but enter the inlets and bays, sail up a couple of miles the giant rivers and numerous fords, and here the endless stretch of forest has begun. The river banks are clothed, the plains and valleys are filled, pushing the way even to the summits of the highest hills, where the thickness in growth decreases. North of 56 deg. latitude the thickness diminishes, but in Hamilton Inlet, Lake Melville country, and around Sandwich Bay, and the multiplicity of rivers falling into the Atlantic, the forest is practically continuous.

Professor Lowe, of the Canadian Survey, speaking of the timber at Hamilton Inlet, says: "Spruce is abundant on the lowlands, and banks of the rivers. Spars and masts for schooners have been taken from these lands. The growth exceeds eighteen inches in diameter, and grows sufficiently tall to allow three good logs being cut from a single tree."

Governor McGregor, late of Newfoundland, in his official report, says: "The country on both sides of the Hamilton river is thickly covered, chiefly with white and black spruce. The trees seemed about 40 to 50 feet high, but some reached up to 80 feet."

Alfred Dickie, of Nova Scotia, writes: "The trees were larger and longer than that grown in Maine, Nova Scotia, or any other eastern province."

Mr. W. A. Calhoun, consulting engineer for the Kentucky Electric Light and Power Company, wrote in 1912: "I believe Labrador will, in the next few years, furnish the majority of spruce in connection with the pulp and paper of the United States and England."

Perhaps the best living authority on this subject is Mr. B. M. McGrath, a native of this country. Mr. McGrath has very large holdings at Labrador. In one of his reports he says, "No country in the world contains such an admixture of woods so suitable for pulp and colliery. The network of rivers intersecting that lone land afford ready access of logs to tidal waters. The harbours are safe, shipping facilities excellent, and being nearer to the British market than any other part of America, in the immediate future it will be the most convenient source of supply for the United Kingdom for these classes of wood.

It seems as if this great peninsula were fashioned by nature as the ideal place for pulp mills. For as far as water power is necessary, the interior country is a virtual archiplago reversed. For centuries these great water powers have been running unharnessed. Not one, but dozens of them, one or two of which outrival the great Niagara; and now that the industrial door to these great resources has been thrown open, the

utilization of these great avenues of water will play a great part, no doubt, in the development of the timber resources. The greatest of these great water powers is the Grand Falls, flowing into Hamilton Inlet. An American traveller, Henry G. Bryant, who visited these falls in 1891, said: "A single glance showed that we had before us one of the greatest water falls in the world. . . . A mile above the main leap the river is four hundred yards wide, already flowing at accelerated speed. . . . An immense volume of water precipitates itself over the rocky ledge, and . . . . the roar of the cataract can be heard for twenty miles. The height of the fall may be considered more than three hundred feet, the vertical height of the chute thirty-two feet, and from the head of the chute to the surface of the water in the chasm about three hundred and forty-eight feet. . . . They are nearly twice as high as Niagara. This great volume of water is easily the greatest single water power in North America, for it is potential of developing nine or ten million horse power. Another very great water falls is the Muskrat Falls, on the same river as Grand Falls, and has the advantage of being nearer tidal waters being about thirty miles from the mouth of the Grand River. Other notable falls of Labrador are the Horse Shoe Falls, the Minipi Rapids, Porcupine Falls, which are all capable of producing enormous powers.

North of Hamilton Inlet at Nakoak, the Silver Falls leaped 400 feet into the sea, and farther south, enormous water powers ar found on the Eagle and White Bear rivers, splendidly adapted for pulp mill purposes. All of the several rivers that flow into the Strait of Belle Isle and the Gulf of St. Lawrence contain water powers more or less great. The rivers are principally the Esquimaux, St. Augustine, Roman and Nabastikaran.

In view of these great dormant resources made attractive by the liberal legislation of the Newfoundland Government last session, the time seems at hand when the silence of centuries will be broken by the throb of machinery in the pulp and lumber mills.

PAPER FROM COTTON

The first commercial mill in the world for making paper pulp and paper from cotton stalks is now in course of erection at Greenwood, Mississippi, U.S.A. Large quantities of old cotton stalks are being delivered at the site of the new mill, and paid for at the rate of about 12s. a ton. The mill will consume daily 150 tons, from which it will produce 50 tons of valuable pulp. A writer in the "Journal of the Royal Society of Arts" says that the annual supply of cotton stalks in the Southern States is about 75,000,000 tons.

BRITISH PAPER BAG EXPORTS.

Paper bags were exported from the United Kingdom during 1914 and the four preceding years as under:—

1914	48,816 cwts.	£53,528
1913	52,474 "	57,622
1912	47,859 "	53,563
1911	39,914 "	42,705
1910	41,402 "	42,442

William Robinson, late with Price Bros. & Co., has joined the staff of the Laurentide Co., with which company he was for several years as their representative in Great Britain.

The Tree of Tule---Oldest on Earth

About 13 miles south-east of Oaxaca City, Mexico, may be seen that which is thought to be the oldest living thing upon the earth. This is the famous cypress known as the "Tree of Tule." It lives and stands a neighbor of the quaint and venerable Church of Santa Maria del Tule. In 1804 the eminent antiquarian and traveller, Baron von Humboldt, returning from his examination of the remains of the pre-Columbian city of Mitla, in the State of Oaxaca, visited and measured the dimensions of this wonderful tree. In his voluminous work, "Histoire de la Geographie du Nouveau Continent," Humboldt records that he measured the girth of the cypress and attached a brass plate giving the date of his visit, and the dimensions of the tree. He contends that the "Tree of Tule" is five or six thousand years old.

All arborists admit that the members of the cypress family of trees are very slow growers. Gazing with awe on the gigantic bole of this solitary survivor of the forest that disappeared in the remote past, one can, without any great flight of imagination, believe that it existed before the Noachic deluge and is today the Methuselah of the vegetable kingdom.

In 1903 Dr. Herman von Schhrenk, a member of the United States forestry service, visited Santa Maria del Tule, measured the bole of the tree four feet above the ground, and certifies it to be 126 feet in circumference. Twenty-six persons of ordinary size standing with outstretched hands in a ring and tipping fingers could barely circle this monstrous thing of life.

Humboldt, von Schrenk and other experts have estimated its age at almost 6,000 years.

LUMBER FOR ENGLAND.

The shipments of "sawn or split" timber from Canada to the United Kingdom in August reached 201,744 loads, contrasted with only 93,847 loads in August of 1914.

PRINTING PAPERS COMBINE.

Announcement was recently made in New York of a consolidation of three printing trade papers. The American Printer, of New York, the Printing Trade News, of New York, and The Master Printer, of Philadelphia. The consolidated publication will be issued semi-monthly in future, under the name of The American Printer.

BOOMING THE CIRCULATION

"If the young man who was seen Sunday evening kissing his best girl while standing at the front gate will subscribe for The Observer before next press-day, no further mention will be made of the matter." Hartford (Ark.) Observer.

GERMAN PAPERS CEASE TO EXIST.

On the first of July, according to the Inland Printer, two hundred German newspapers ceased publication. Since the beginning of the war about twelve hundred have ceased to appear, for the time being, and about the same number have increased their subscription price.

Ottawa Notes

Ottawa, Ont., October 25.—Manufacturers of lumber, pulp and paper up to a short time ago had a surplus of labor on their hands. Now there is a shortage, according to a statement made last week by the minister of labor, Hon. T. W. Crothers, and so acute has it become that the suggestion has been made that German and Austrian prisoners of war be made available for employment in lumber camps, pulp and paper mills or the like.

Mr. Crothers states that he has received from a company which intends to construct a big pulp mill in Northern Quebec midway between Quebec and Cochrane on the National Transcontinental railway, an application for 1,000 men. From a New Brunswick manufacturer has come a request for 500 men. It is the latter who has suggested the employment of interned alien enemies, pointing out that in Germany such prisoners are required to work. Hon. Mr. Crothers does not view this proposition with favor, however.

The minister of labor, in fact, thinks that the situation is partly the fault of the employers themselves. He stated that he did not approve of the practice of firms who when they send men to the camps to log lumber or cut pulpwood, charge them $20 and more per month for their board and require them to buy their supplies at the company stores. Until this was discontinued and fairer wages paid, he stated, there would be a shortage of help.

Mr. D. Lorne McGibbon, formerly associated with the Laurentide Pulp and Paper Company of Grand Mère, and Mr. W. M. Dobell ,a member of the large timber and pulpwood exporting firm of Dobell and Beckett of Quebec and London Eng., have been added to the membership of the Canadian Military Hospitals Commission, of which Mr. F. W. Avery, a well known Ottawa lumberman and Sir Rodolphe Forget, equally prominent in pulp and paper circles, are already members. The scope of this Commission, according to an announcement last week has been greatly enlarged and it will now have charge of the very important work of providing employment for returned Canadian soldiers. Lumber and pulp and paper manufacturers, in common with other employers of labor, will be circularized in connection with the provision of such employment, for which a broad scheme has already been prepared.

Hopes are being held out that in the near future the insurance surtax placed some months ago on all business properties in the city including pulp and paper plants, will shortly be removed. Recently half the surtax was removed on most classes of properties but the whole burden was allowed to remain on lumber and pulp and paper plants. Communications which have passed between the mayor and the Canadian Fire Underwriters, however, had led the former to announce that as a result of improved fire fighting facilities, the whole surtax may be removed, it is hoped, from all plants.

Mr. M. J. O'Brien, a well known figure in pulp and paper field, has signalized his recovery from a recent operation in Montreal for peritonitis, by organizing a two million dollar company to manufacture munitions. It is understood that Mr. O'Brien himself has put $500,000 into the enterprise.

The Supreme Court of Canada, which has resumed its sittings in Ottawa, last week heard for the second time a case of considerable interest to the trade, that of Leamy vs. the King. The Misses Leamy of Hull are claiming, as descendants of one Philemon Wright, an early settler, a part of the bed of the Gatineau river now used by the Government as a site for timber booms. The Attorney-General of Quebec has intervened in the case on behalf of that province, and was last week given permission to introduce evidence as to the navigability of the river prior to the grant to Philemon Wright. For this purpose it will introduce some very ancient evidence, being the instructions given to Canadian governors prior to the cession of this country by France to England, and the instructions from the Crown in regard to the disposal of Crown lands after the English occupation.

A meeting of employes of the local paper mills was held last week at which the sending of financial assistance to strikers at the Donnaconna mills was discussed. It was finally decided to continue such aid, and it was stated that prospects were for a terminating of the disagreement shortly.

Mac.

Forest Fire Losses

Fire losses in Washington State in the season just closed are less than half of those of one year ago, according to statistics compiled by State Forester E. W. Ferris.

Mr. Ferris' statistics show 13,835,000 feet of timber fire-killed, practically all of which can be logged before deterioration sets in, and 5,594,000 feet destroyed.

During the 1914 season losses were reported at 26,850,0000 feet re-killed and 18,141,000 feet destroyed.

NOT PAPER BULLETS HOWEVER.

Paper mills at Portsmouth, N.H., which cost $2,000,000, will be used as munition plants, it is said, by New York concern known as R. B. Phillips Co.

The export of paper to Russia has been consented to by the Swedish Government.

John Martin, head of the John Martin Paper Company, Winnipeg, Canada, and who, as reported, has been striving to bring about an organization of Canadian paper jobbers, has temporarily abandoned the project.

John Bower, who was formerly with the New Brunswick Pulp and Paper Co., Millerton, N.B., has been appointed Maritime Province representative of the Victoria Twine Co., Toronto, and has entered on his new duties.

The Peninsular Pulp and Paper Co., with a capital stock of $200,000 has been incorporated to take over the Inland Pulp and Paper Co., of Thorold, and conduct a "paper and pulp wood business". The head office of the new company will be at Thorold, Ont.

The Ontario Land and Forests Department has received tenders for the pulpwood concession at Le Sevel, Kenora district, so far none have been accepted. The time for receiving tenders closed a month ago.

UNITED STATES NOTES

Contractors have started work on re-building the plant of the Otter River Board Company, at Otter River, Mass., which was gutted by fire about a month ago at a loss of $10,000. It is understood that the greater part of this loss was covered by insurance, and as the plant had considerable orders ahead at the time of the fire, plans of having the building re-built were let out as soon as the insurance could be adjusted. This concern manufactures binders, trunks and special button boards.

* * *

All litigation in the bankruptcy proceedings of the Battle Island Paper Company of Fulton, N.Y., has ceased. An order, issued by U. S. Justice George W. Ray, of the Northern District of New York, has been received by County Clerk Z. D. Staunton for the sale of the sulphite mill at public auction. Besides the plant itself the property to be disposed of consists of several acres of land and certain rights of way. Thursday, November 4, is the date set by Judge Ray for the sale of the property, and the sale will be made at the court house in Oswego by Charles N. Bulge, of Syracuse; David F. Costello, of Oswego, and Nelson P. Bouney, of Norwich, the trustees under the direction of Gaunou, Spencer & Michelle, of Syracuse, attorneys for the trustees. The report of the trustees in bankruptcy will be presented to Judge Ray at the court house, Auburn, at eleven o'clock on the morning of November 16. At that time the Columbia Trust Company, of New York, which is quite deeply interested in the affairs of the defunct company, the creditors and all persons interested in the estate of the bankrupt concern will have been cited to appear and show cause, if any exists, why the sale should not be confirmed.

* * *

President Frank L. Moore, of the Empire State Forest Products Association, of this city, is now giving consideration to the annual meeting of that organization, which will occur about the middle of next month. While the place of holding the meeting is still undecided, it will probably be held on the 11th or 18th of the month. As soon as the place of meeting and the date have been decided upon, President Moore will make arrangements for the programme. As usual, the committee reports will be made, and talks by prominent men familiar with lumbering and forest conditions will be heard.

* * *

Several schooners laden with pulp wood from points along the Potomac river have arrived by Alexandria, Va., near here, in the past few days. At Alexandria their cargoes are being loaded on cars for shipment to plants in West Virginia. The shipping of the pulp wood to Alexandria and to Elkton, Md., Philadelphia and other points from along the Potomac will be brisk this fall, according to predictions made by the boatmen.

* * *

It is reported that the Taggart Brothers, operating a large mill at Watertown, N.Y., will shortly erect a new plant just below the present mill, which will be the largest in that city. The same grade of paper will be manufactured as in the old one, and the whole plant will be run separately from the old one, When interviewed last week, B. B. Taggart, of the company, admitted the accuracy of the report that the new mill was contemplated. He said that they had gone over the ground carefully, and have even gone so far as to have architects prepare plans of the proposed mill, but he would not say just when the actual construction work would be started. Recently a new chemical laboratory was fully equipped, and an expert chemist placed in charge. This step was taken in order to add efficiency to the operations at the plant. A new office building is now being completed near the mill.

* * *

The construction work on the new Rex Paper Company's mill at Kalamazoo, Mich., is progressing rapidly, the weather during the past few days having been exceedingly favorable to outdoor work. Besides the mason work on the walls of the building, there is a big job for the bricklayers in building the well which will furnish water for the mill. Over 50,000 bricks will be used in the well alone, it being 18 feet in diameter. The building will be enclosed by December 1.

* * *

An automatic sprinkler system is being installed at the plant of the North End Paper Company at Fulton, N.Y. Concrete foundations, for the big steel tower on which will rest a steel tank with a capacity of 40,000 gallons, have been completed. The base of the tank will have an elevation of eight feet above the ground. Workmen are already at work on the construction of the tank. This system will be completed in a short time, and will add much to the fire-lighting equipment of the plant.

* * *

John H. Walker, one of the veterans of the New York paper trade, died during the past fortnight as a result of surgical operation. He was born September 18, 1844, and was in his 72nd year. The deceased was connected with the trade for a period of 50 years. He began with his father, the late F. R. Walker, who, starting in the jobbing business, later operated a mill at Burnside, Conn. In 1880 Mr. Walker was taken into partnership with his father, the firm name being changed to F. R. Walker & Son. In 1895 he bought out his father's interest, and from that time conducted the business under his own name. In 1910 he gave up his paper store at 16-18 Reade Street, where he did a general jobbing business, and about three years ago discontinued operating the mill.

* * *

H. G. Craig & Co., for the past few years located at 200 Fifth Avenue, New York, have taken about 9,000 square feet of space on the seventh floor of the Vanderbilt Concourse building, which adjoins the Grand Central Station on the Madison Avenue side. This breaking away from the Fifth Avenue building by H. C. Craig & Co. sets a precedent, the effect of which on the other tenants will be awaited with interest.

Hans Lagerhof, president of the Scandinavian-American Trading Co., of New York, sailed on Saturday of last week on the steamship Bergebsfjoid, for a six weeks' trip to Europe.

* * *

The Warner-Kilipstein Chemical Company has been incorporated to manufacture dyes with a capital of $500,000. Work has already started on the erection of a large plant in South Charleston. The incorporators, all New Yorkers, are Lucien C. Warner, Ernest C. Klipstein, Franklin H. Warner and Harry R. Nelson. Mr. Klipstein is said to be one of the largest dye importers in the United States. It is reported that the plant will use a new process by which dyes and colors heretofore procurable only in Germany will be made.

* * *

The construction work at the plant of the Oswego Falls Pulp an dPaper Company at Fulton, N.Y., is progressing rapidly, and it is hoped that the power plant will be in operation by January 1. As soon as the steel work and crane are up the three large water sheds will be installed. The pulp mill buildings have been completed, and are ready for the installation of machinery. Besides the new buildings, two small additions have been built on the paper mill. One will be fitted up as a grinder room.

Laurentide Power Company's Plant

A party consisting of some sixty bankers, brokers and newspaper men visited the new power plant of the Laurentide Company on Sunday, traveling by special train from the Place Viger Station, in Montreal, to Grand Mere. A few days ago the first unit of 20,000 H.P. was put in operation, and the visitors had, therefore, an opportunity of seeing the plant in operation. The company has been its own contractor, and the immense amount of work which has been carried on during the past few months by its engineering staff is a tribute to the efficiency of that body. At the present time the power house, with its six units of 20,000 H.P. each, is practically complete. The machinery is all on the ground and is being put in place, while the construction of the dams which will furnish the additional thirty feet head of water necessary to the operation of the six units is being proceeded with.

The party was in charge of Mr. George Chahoon, Jr., President of the Laurentide Company, Mr. F. A. Sabbaton, a director, and Mr. J. H. A. Acer, the Sales Manager.

LAURENTIDE COMPANY'S LIMITED, NEW POWER PLANT AT GRAND MERE.

PULP AND PAPER NEWS

Albert Grigg, former M.P.P. for Algoma, has entered upon his new duties as Deputy Minister of Lands and Forests for the Province of Ontario, in succession to the late Aubrey White.

Allan Gillies, proprietor of the Watchman-Warder, Lindsay, Ont., and a former business manager of the Stratford Herald, was drowned recently in the Seugog river, when he lost the channel and his gasoline launch rammed on to a hidden stump, tearing a hole in the craft. Mr. Gillies was thirty years of age, and leaves a wife and two children.

George C. Winlow, of the Canada Paper Co.'s selling staff, Toronto, has returned from a successful business trip to Winnipeg, and other points. He reports that trade in the paper line is greatly improving in the West, and the outlook is much brighter than a year ago.

A suit arising over the commission on a sale of pulp wood limits in Quebec was before the Appellate Court in Toronto, and udgment reserved in an appeal. W. A. Rushworth, broker, of Toronto, claimed $15,000 commission from the vendor of the lands, P. P. Johnston, of Toronto, and in an action, heard before Mr. Justice Meredith some time ago, the case was dismissed.

Hercules Boxes, Limited, 400 Richmond street west, Toronto, have sold out to A. D. Shoup and Co., Limited, paper box manufacturers, 310 Spadina Ave., Toronto.

The Paste and Gum Co., Limited, of Toronto, has been granted a charter with a capital stock of $40,000 to take over the business of the paste and gum company formerly carried on by Robert Ellis, and manufacture and deal in paste and gum of all kinds.

Routley's, Limited, with a capital stock of $40,000, and head offices in Toronto, has been formed to take over the wall paper business of the C. B. Routley Co., 262 Queen St., west, Toronto, and to manufacture and deal in wall paper, burlaps, etc. W. C. Routley, of Toronto, and C. B. Routley, of Peterboro, are among the incorporators.

Frank Annandale, a son of Alex. Annandale, efficiency expert in the Barber mill of the Provincial Paper Mills at Georgetown, Ont., has enlisted for foreign service in the Halton Regiment, and has secured a commission as Lieutenant. He was until recently employed in the laboratory department of the Canada Paper Company at Windsor Mills, Quebec.

For the past nine years it has been sought to wind up the affairs of the Imperial Paper Mills, of Sturgeon Falls, in a manner that will be satisfactory to all creditors, and the matter is still before the courts. In the Non-Jury Assize Court recently in Toronto, the hearing of the suit of Diehl v. Carritt, in which a bondholder and creditor is the nominal plaintiff and the purchaser of the principal assets is nominal defendant, came up, and judgment reserved. The amount involved in the suit is about $75,000. The Imperial Paper Mills was a concern backed mainly by English capital, which in absorbing a number of other companies overburdened itself and had to go into the hands of a receiver. The bondholders took over the property and things have been practically at a standstill for years, several different receivers having taken a hand at the attempt to bring order out of the mess into which the company's affairs had drifted.

For some time rumors have been afloat that a new pulp and paper mill would be built at Smooth Rock Falls, Ont. This is the project in which Duncan Chisholm of Toronto, is interested, and before the war broke out there were plans under way for the erection of a hundred ton pulp mill to be followed later by a paper mill of as great, or even greater capacity. Nothing definite has as yet been arranged, and it is not likely that anything will be done in the line of construction until the war is over.

In the contributions to the Red Cross Fund the amount collected in Toronto alone during the three days of the campaign will, it is expected, reach nearly $600,000. Of the twenty teams lined up in the canvass, that of W. P. Goudy, Vice-President and General Manager of W. J. Gage and Co., and the Kinleith Paper Mills, stoood second, raising $42,805.75, which was only five hundred dollars less than the team led by C. H. Wilson, which took first place.

Arthur T. Wilgress, proprietor of the Brockville Times, has been appointed King's Printer by the Ontario Government, succeeding Lud. K. Cameron, who retired from the position a few months ago owing to poor health, after ably discharging the duties for some twenty-five years. Mr. Cameron is now living in Los Angeles, Cal. Mr. Wilgress bought the Brockville Times in 1895, and has conducted it successfully. For some years previous to entering journalism, Mr. Wilgress, who is a prominent member of the Canadian Press Association, was engaged in banking. He has always taken a deep interest in municipal, educational, charitable and military affairs in Brockville, and many friends will congratulate him on his appointment.

Robert S. Waldie, President of the Toronto Paper Manufacturing Co., was quietly married on October 16 in the Central Presbyterian Church, Hamilton, to Miss Meta, youngest daughter of Sir John M. Gibson, late Lieutenant-Governor of the Province of Ontario. The Rev. Samuel Lyle, D.D., was the officiating clergyman, assisted by the Rev. W. H. Sedgwick. Miss Eugenia Gibson, sister of the bride, was bridesmaid, and the best man was W. C. Cameron. After the ceremony a reception was held at Ravensclife, the home of Sir John and Lady GiGibson. Mr. and Mrs. Waldie will take up residence in Toronto, and their many friends are extending cordial congratulations.

S. J. B. Rolland, President of the Rolland Paper Co., who have paper mills at St. Adele and St. Jerome, Que., has been appointed a member of the new Federal Commission to study a scheme of Canadian national development, with special reference to present conditions, Mr. Rolland is a pioneer in the paper in-

dustry in Quebec, and his appointment has been well received.

City Architect Pearce has sent out a notice to the building trade of Toronto that no wall board will be allowed as a substitute for lath and plaster until it is tested, and the test must show that, from a fire resistance standpoint, it is equal to lath and plaster. Mr. Pearce says that some builders have been trying to slip in wall board, and some of it has been found inferior. Its use has not been permitted since the fire in the Woodbine Hotel, Toronto, several months ago, when it was discovered on the walls.

The Publication Board of the Baptist Book Room, Toronto, according to a report submitted at the recent Baptist Convention in London, Ont., has under advisement the abolition of the retail business carried on in Toronto in connection with the denomination, proposing to carry out the work on a mail order basis, George S. Matthews, on behalf of the Publication Board, showed that the department had been operated at a loss of $3,364. The church publication, the Canadian Baptist, was also reported to have lost money during the past year, while in the twenty-three of the thirty-one years of its publication, it had dropped over $27,000, against $1,433 profits in the other years.

Harry Lomas, for several years manager of Tyrell's book store, Toronto, has started business for himself at 87 King Street east, Toronto, under the name of the Lomas Book and Stationery Co.

George Carruthers, manager of the Interlake Tissue Mills, Toronto, has returned from a business visit to Winnipeg and other cities in western Canada.

At a recent meeting of the Spanish River Pulp and Paper Mills Co., held in Toronto, the following officers were elected: President, W. E. Stavert; Vice-Thomas Gibson; Treasurer, A. H. Chitty.

The Don Valley Paper Co., Toronto, have recently installed a plater for making crash and linen finish cover papers, which is a new line with the firm. The new filtering plant, which was recently put in, is also in operation and working satisfactorily.

Joseph Coley, an employe of the Riordon Pulp and Paper Co., Merritton, Ont., aged 28 years, who had enlisted with the 2nd Dragoons for overseas service, recently committed suicide by drinking carbolic acid. Coley was an exemplary young man, and lately underwent an operation, but had returned to his work at the mill. It is thought that he ended his life owing to despondency over poor health. A brother of the deceased is a drummer with the Welsh Guards in France.

Employes have paid no less than $1,500,000 into the accident fund during the nine months of the operation of the Workmen's Compensation Act in Ontario. 12,659 accidents have been reported to the Board, and of these 139 were fatal. It is estimated that, by the end of the year, between $750,000 and $1,000,000 will have been paid out as compensation to injured workmen. Of the 12,659 accidents reported, 3,972 did not involve claims of compensation, some because the injury did not cause seven days' incapacity, and others because the persons injured were not under the operation of the Act. There are now 689 claims in process of adjustment. It is felt by some employers, particularly pulp and paper manufacturers, that the assessments made by the Board have been higher than necessary that is, the total assessments will be more than sufficient to pay claims for accidents during the year. The Board do not dispute this, and admit that the experience, during the first nine months, does appear to indicate that, in a number of the classes or groups, this is the case. They say, however, that, at most, they could only hope that their assessments would be approximate. There was no data available to guide them in estimating how many accidents were likely to occur in any line of industry. The theory and intention of the Act is that assessments shall be sufficient and only sufficient to pay the actual compensation provided by the Act, and it will take the experience of the Board for one or two years to enable the members to strike the exact figure.

Two million dollars will be the revenue this year from lands, forests and mines in the Province of Ontario. On account of the war the revenue from these sources fell off last year below the estimate, but there has been an appreciable improvement of late months so far as lumber is concerned, particularly in the American market, which was, to some extent, panicky twelve months ago by reason of the unsettled condition of things. This year Hon. G. H. Ferguson, Minister of Lands, Forests and Mines, reports that the outlook is very promising.

PAPER IMPORTED INTO ARGENTINE.

There is an undoubted opportunity for British manufacturers to obtain possession of this important trade, which has hitherto been largely in the hands of Germans. Local factories are unable to meet the demand and the duties on various classes of imported paper have recently been lowered, in spite of the opposition of local interests, in order to encourage importation. Speaking generally, it may be said that high quality—apart from standard qualities for printinf, etc.—is not so essential as low cost. Complaints have been made about methods of packing high-class English art paper. The German modus operandi has been to encourage a small trader to set up his own printing press, which they supply on ridiculously easy credit terms on condition that all paper is bought from them. In many cases the machinery reverts to them through inability to keep up payments and then is resold to the next victim on similar conditions. The secretary of the local British Chamber of Commerce (Calle Sarmiento 643) has prepared notes on the subject of the requirements of the customer. It is stated that "German travellers showed great willingness and ability to meet the wishes of their customers down to the smallest detail." German firms also supply catalogues and excellent advertising and descriptive matter in Spanish. The supply of samples, too, is another point in which the Germans have learned the wisdom of concession to local custom and demand.—(The Papermaker.)

MILLERTON PULP AND PAPER MILL.

Despatches from New Brunswick state that a large amount of English capital has been subscribed for the rebuilding of the Millerton pulp and paper mill. It is said, however, that after the capital had been subscribed, amounting to not less than a quarter of a million, the English authorities thought the money might be needed at home, so it was decided to do nothing in the matter until after the war had been successfully ended.

MEETING OF THE TECHNICAL SECTION.

At a meeting on October 8, the Council of the Technical Section of the Canadian Pulp & Paper Association received and passed upon thirty-one applications for membership in the Section. This is a most auspicious beginning. The Technical Section is working along quietly with full determination to do a really good and constructive work among paper makers. The Council has decided upon a course which involves thoroughness in the performance of their work, and nothing will be done in a hasty and haphazard manner.

The Technical Section has chosen November 19 as the date for the fall meeting. Preparations are being made which will ensure a most profitable day to all who attend. We understand that the Council will be guided by the principle that assimilation is the real point in partaking of food for the mind as well as for the body. Hence, the number of papers will be reduced to two, or at the most, three, and the points raised by speakers will be thoroughly digested. The meeting will be far from formal; it will be a gathering primarily devoted to promoting acquaintance, good fellowship and interchange of ideas.

We hope that this most wise proposal will fin response in paper makers the country over. The meeting is bound to be a good one, even if only a dozen members turn up, but certainly "the more the merrier," and the more pronounced will be the advocate made by paper makers individually and as a unit.

PULP AND PAPER MEN PROSPERING

"Business as Usual" seems to be the order of the day for pulp and paper manufacturers. Recent trade returns show that the Canadian pulp and paper industry is prospering.

Since the opening of the current fiscal year exports to the United States especially have grown. July Government returns show exports of newsprint to the United States of $1,274,000. The export business of Canadian mills for the first four months, April to July, aggregated $5,098,799, of which the United States accounted for $4,589,144. While the total compares with $4,213,000 in 1914, only $2,176,000 went across the border that year. As an indication of recent growth this year's business so far is almost equal to eight months' business in 1913, and surpasses eight months' business in 1912, the total then being only $3,110,000. While the United States is Canada's best customer, the statement points out that another encouraging feature of the trade is the growing trade within the Empire.

For the fiscal year 1913-14, the total exports were $8,030,00 for the 1914-15 $12,600,000, while the rate of the four months this year is between $15,000,000 and $16 000.000 per annum. The first four months of 1913, 1914 and 1915 compare as follows in exports of newsprint:—

	1913.	1914.	1915.
April .. .. ..$	596,554	$ 836,110	$ 970,445
May	810,575	1,092,172	1,341,243
June	874,284	1,135,283	1,345,444
July	793,898	1,149,569	1,441,647
Totals ...	$3,075,319	$4,213,134	4,098,779

Technical Section of Pulp and Paper Association

There were present: Dr. Bates, C. B. Thorne, T. Linsey Crossley, G. W. Dickson, Roy Campbell, Secy.

The reports of committees were received as follows:

Mr. J. A. DeCew, for the Committee on Standards, reported progress and advised that the Committee be reorganized to include the following: G. W. Dickson, A. O. Bowness, A. G. McIntyre, Fred Barnes, B. Johnson, E. B. Slack.

Mr. T. Linsey Crossley, for the Committee on Technical Education, reported that the Committee was analyzing the situation carefully, and had secured offers of co-operation from a couple of sources, notably from "Training," the official organ of the Canadian Association for the Promotion of Technical Education. Mr. Crossley was instructed to have his Committee proceed along the lines which it had laid out.

Mr. C. B. Thorne, for the Committee on the collection of samples, reported the drafting of a letter submitted to the meeting, and that the letter would go out in the course of a few days.

Mr. O. F. Bryant, for the Committee on Literature and Statisties, reported that a survey of the field was being undertaken, and that different alternatives for the collection of foreign periodicals and for the translation of same, were being carefully considered.

Co-operation between the Forest Products Laboratories and the members of the Technical Section was brought up and discussed, and the matter finally returned to the hands of the Committee.

It was decided to hold a meeting on November 19, in Montreal, and the Chairman and Secretary were instructed to complete arrangements. The names of several gentlemen as speakers were suggested.

Thirty-one applications for membership were received and approved.

After informal discussion along several lines, the meeting adjourned.

The personnel of the various committees is as follows:—

Committee on Standards and Methods of Testing:—J. A. DeCew, Chairman, Process Engineers, Ltd., Montreal; G. W. Dickson, Laurentide Co., Ltd., Grand'Mere; A. O. Bowness, E. B. Eddy Co., Ltd., Hull, Que.; A. G. McIntyre, Bathurst Lumber Co., Ltd., Bathurst, N.B.; Fred Barnes, Belgo-Canadian Pulp & Paper Co., Ltd., Shawinigan Falls; B. Johnsen, Forest Products Laboratories, Montreal; E. B. Slack, Riordon Pulp & Paper Co., Ltd., Hawkesbury.

Comittee on Literature and Statistics.—O. F. Bryant, Chairman, Forest Products Laboratories, Montreal; H. S. Taylor, Spanish River Pulp & Paper Mills, Ltd., Sault Ste. Marie; Sigmund Wang, Riordon Pulp & Paper Co., Ltd., Hawkesbury.

Committee on Technical Education—T. L. Crossley, Chairman, Laboratory of J. T. Donald, Montreal; R. L. Campbell, Secretary Canadian Pulp and Paper Association; Olivier Rolland, Rolland Paper Company, St. Jerome; C. F. Buss, St. Lawrence Paper Mills, Mille Roche.

Committee on Collection of Paper Samples.—C. B. Thorne, Riordan Pulp and Paper Co., Ltd., Hawkesbury; Dan Daverin, St. Lawrence Paper Mills, Thorold; R. L. Campbell, Secretary Canadian Pulp and Paper Association.

The Markets

CANADIAN MARKETS

The market for news print continues brisk so far as the export business is concerned, while local consumption remains about the same. Prices remain firm and unchanged. One gratifying feature is the large amount of export business that is being done, particularly to various parts of the British Empire, by Canadian plants. The export trade to England has doubled within the past few months in the matter of news print, while the shipments to Australia have shown considerable increase. It is interesting to note that the business in the news line has so developed that Canada is now exporting about a million and a half dollars worth a month. It was in November, 1913, that the shipments of newsprint abroad reached over the million mark, and the growth in the last two years is really remarkable, increasing virtually fifty per cent. Over four-fifths of the print paper exported is purchased by United States mills and paper houses, as, since the opening of the new fiscal year, Uncle Sam has been taking over a million dollars monthly, and in July last the figure reached $1,273,585, while the total export business for that month from Canada aggregated $1,441,647. This is a new top water mark.

The amount of the export business in newsprint during the last four months totalled $5,098,779. The export of chemical pulp for the same period was $1,634,876, while in ground wood pulp the aggregate for the four months was $867,648.

Since January last there has not been much change in the export figures so far as chemical pulp is concerned, the shipments each month representing about $400,000, sometimes going a few thousand dollars over, and at others a few thousand under this sum. Ground wood pulp took a big jump in July and the shipments reached $468,385, the largest since October, 1914.

In book, bond and ledger paper line, fall orders are looming up very well, and, while there is no great activity, the mills report that a feeling of better confidence is prevailing, and a very fair turnover is looked for. The dye situation is still acute, and prices on certain colored lines are stiffening. Coated paper plants are pretty active, and in the light wrapping line, toilet and tissue papers, there is a good business being done. Jobbers state that they have no complaint to make of the demand for all lines, and the volume is considerably ahead of what it was in the corresponding month last year.

Envelope manufacturers report that business has picked up considerably during the past month, and is ahead of a year ago. More white and brown envelopes are being made, as owing to the scarcity of colors and the high prices, manufacturers are not pushing any of the fancy lines. The demand for papetries, pads and decorative lines of stationery for the holiday trade is very brisk and producers will have to have all their goods out within six weeks time.

In the ground wood pulp line there is no great change. Water conditions continue satisfactory, and sales are not numerous owing to so many plants on the other side of the border running their own grinders. A good deal of exporting is being done to England, Italy and France. Prices are holding fairly firm.

In the sulphite situation there is much anxiety regarding the future, and quotations continue to stiffen. Very little is being imported, as European countries are buying up the surplus stock, and supplies of the mills in Sweden and Norway. The future is fraught with much uncertainty, and consumers are beginning to fear that they may have trouble in securing enough to meet their needs, while Canadian plants do not care to enter into any long term contracts. Many inquiries are being received, and each week the cellulose outlook grows more precarious.

In the rag and paper stock arena there is an improvement in the lower grades. Roofing stock is stiffening all the time, and there is a better demand for some other lines.

Owing to the revival in building operations this fall in a number of Canadian cities, there is a marked improvement in conditions which have been dull all summer. Makers of building paper think that a very good fall trade will be done.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.90 to $1.95 at mill, in carload lots.
News (sheets), $1.95 to $2.05 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite (unbleached), $40 to $44, del. in Canada.
Sulphite (unbleached), $40 to $46, delivered in U.S.
Sulphite (bleached), $54 to $58.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, 85c.
No. 2 book stock, 40c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.05.

No. 1 print Manilas, 75c.
Folded News, 35c.
Over issues, 45c.
No. 1 cleaned mixed paper, 32½c.
Old white cotton, $1.90.
No. 1 white shirt cuttings, $4.50.
Black overall cuttings, $1.50.
Thirds, blues, $1.30.
Black linings, $1.50.
New light flannelettes, $4.00.
Ordinary satinets, $1.15.
Flock, $1.25.
Tailor rags, $1.05.
Blue overall cuttings, $3.50.
Manila rope, 2½.
No. 1 burlap bagging, $1.15.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine)

New York, N.Y., October 25, 1915.

The situation in the ground wood pulp market in this locality continues without change. There is practically no demand for stock in any quarter as water conditions in the East have been so favorable during the past few months that those consumers that make their own pulp have been able to run their grinders practically at full capacity. The consequence is that supplies in hand at the mills are uite adequate to take care of current needs. As long as this condition continues there is little likelihood of prices assuming anywhere like normal. According to importers, there continues to be a very good demand from foreign sources, but shipping conditions are still very unfavorable.

Sulphite pulps of all descriptions are very strong and active. Prices are maintained on a very firm basis and continue to tend upward. Domestic consumers are gradually becoming aware that the situation as regards securing supplies from Scandinavia and other producing points is not as favorable as could be expected. As a consequence, many of the domestic consumers are entering the market anticipating their future needs. This has naturally made the situation very strong for the importers as well as for the domestic manufacturers. While the actual demand during the past fortnight has not been of sufficient proportions to make this situation really felt, the inquiries have been sufficient to anticipate such. Domestic manufacturers have been particularly fortunate in disposing of their supplies on account of the non-arrival of European supplies. Canadian mills, too, have shared likewise and the situation on all sides points to a most favorable end for the producers. The high prices which are being asked for the foreign makes is reflecting in the favor of the domestic manufacturer, and mills in this country report that they are practically sold out for the next eighteen months. No encouragement can be given purchasers for foreign goods, and this situation is undoubtedly reacting against those grades which are made abroad. The pulp which is now coming into the domestic ports is almost entirely consigned to old contracts. The stocks on the docks in this country have been so depleted that they are not to be considered in discussing the real market situation. Conditions abroad, if anything, have become more precarious, as advices refer to their troubles being added to the many other difficulties in the manufacture of pulp. Bleached and unbleached sulphites can be rightly termed as very strong; krafts are firm and being well maintained in price, and sulphites are high and firm.

The rag situation continues along the same line as reported two weeks ago. The market is shaping itself on a very firm basis, and prices will undoubtedly sooner or later reach a prohibitive mark. During the summer months the demand was so poor that packers were barely able to secure any price at all for their stocks, but now the situation has changed, and now that writing mills have increased their outputs, the market for all grades has become very firm. The situation has been brought about partly by the above and partly because the imports from Europe have been greatly diminished of late. Supplies on hand at present are not over heavy and the seriousness of the situation can only be realized when it is known that we have heretofore depended on foreign supplies to cover a large deficit which cannot be met by domestic collections. Bagging is still strong and inquiry good. Supplies are far from sufficient to meet immediate needs, and prices are, in sympathy, tending upward. Domestic gunny is selling at 1.80c to 2c; foreign gunny at 1.90c to 2.15c; bright bagging at 1½c to 1¾c; sound bagging at 1.30c to 1.35c; mixed bagging at 1.05c to

1.15c, and Manila rope at 2.90c to 3c. The demand for old waste papers has eased up somewhat of late, but there is still a fair call for several of the grades. Manilas and Krafts particularly are active, while mixed papers are moving in a seasonable way.

The month of October in the local paper distributing market has proven very satisfactory for all concerned. While the talk is continually heard that "business is poor," it is a fact that many of the jobbers are now enjoying a much better business than they have for many months past. The demand for all grades has improved satisfactory, and there is every indication that the improvement will continue for the time being at least. The increased cost in the raw materials in the manufacture of paper is greatly affecting prices and very little "cutting" is now being reported in local circles. A number of the manufacturers have already prepared new schedules in prices, but where advances are noted, they are chiefly in the colored papers. This is due directly to the dye situation. Large consumers are beginning to anticipate their needs as many of them are realizing the acuteness of the situation and desire to cover themselves before a decidedly upward trend is made. Tissues are now enjoying a pretty strong demand and prices are more satisfactory than they have been for months. Manila papers are firming decidedly under the influence of a fairly strong inquiry. Fibre papers are well up to the standard, prices being firmly maintained, and in some instances advancing. Kraft papers reflect pretty much the same condition. Book papers are also in strong inquiry, and a great improvement in prices has been noted during the past month. Boards are moving well and selling at much better values. News papers and fine papers are both enjoying an exceptionally good demand and prices are being firmly maintained. General market quotations as they exist in New York to-day, are as follows:—

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 1.90c to 2.25c., delivered.
Bleached Sulphite, domestic, 2.80c to 3c., delivered.
Bleached Sulphite, impt., 2.70c to 3.15c., ex-dock, N.Y.
Easy Bleaching, impt., 2.25c to 2.45c. ex-dock, N.Y.
Unbleached Sulphate, impt., 1.85c to 2.05c., ex-dock, N.Y.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 1.95c to 2.00c.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $24 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $22 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

PULP AND PAPER CONSUMPTION.

G. R. Snellman, of Holsingfors, has tabulated the world's annual consumption of paper and pulp as follows:—

	Cellulose Pulp. Tons.	Mechanical Pulp. Tons.	Paper. Tons.	Cardboard. Tons.
Belgium	31,500	1,000	132,850	5,550
Germany	571,281	679,520	1,350,720	187,032
Great Britain	....	....	866,160	17,730
Finland	66,107	116,686	98,243	2,800
France	52,300	61,200	604,981	42,950
Japan	12,000	15,000	98,000	5,250
Italy	6,500	50,250	231,620	4,050
Canada	208,300	480,400	256,900	51,150
Holland	11,500	....	81,250	113,100
Norway	276,030	327,050	124,100	500
Aust.-Hungary	261,512	232,259	361,915	36,067
Russia	109,000	20,350	223,250	25,600
Sweden	536,070	230,750	235,200	5,410
Switzerland	18,900	17,050	45,750	15,020
Spain	2,400	4,400	73,820	4,380
United States	1,163,368	1,285,020	2,903,792	1,057,980
Other countries of Europe	10,100	8,740	48,540	740
Other countries of Asia	....	....	41,000	....
Other countries of America	5,400	2,000	62,300	530
Africa	....	....	2,500	450
Australia	....	....	13,700	....
Total	3,343,168	3,531,675	7,856,591	1,576,289

SWEDISH PRICES FOR SULPHATE AND CRAFT.

Svenska Pappersbruks, foreningen of the Swedish Papermakers' Association, has, on meeting, decided that the price for sulphate- and craft-paper will be £20 f.o.b.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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The Dyestuffs Problem

Mr. T. H. Wardleworth, of the National Drug and Chemical Co. of Canada, Limited, Montreal, brought a ray of sunshine into the hearts of papermakers at a recent meeting of the Canadian Pulp and Paper Association in Montreal, when speaking on the subject of the dyestuffs problem. He made the statement that within two or three years paper makers on this continent would be independent of German supplies. Mr. Wardleworth based his opinion on the very rapid strides which are being made by chemists of the United States in building up the dyestuffs industry. The recent exhibition of chemical industries held in New York City was a revelation to all who attended. Evidences of progress were to be noticed, not only in tangible products, but in the feeling of the members of chemical industries, that the United States is well on the way towards virtual independence in a great many lines of chemical products. Some of the dyes which are being manufactured stand every test, and capital and inventive genius are combining in a manner wholly unprecedented.

Nor is Canada lagging in these matters. Mr. Wardleworth mentioned at least two instances in which Canadian chemists are producing new materials over which Germany formerly had practically complete control, and, although Canada is merely in swaddling clothes, so to speak, the prospects for vigorous adolescence are indeed bright.

This dyestuff question is one which has been the subject of voluminous controversy in the United States. Unfortunately, the remedies which have been proposed have come largely from men insufficiently informed, and what some experts urged at the outbreak of the European conflict is now being better appreciated, namely, that it is idle to suppose that what the German dye industries, aided by a marvellous research system, the unwavering support of the Government, and one of the most aggressive selling arrangements which commerce has ever known, nearly took half a century to accomplish, can be duplicated on this continent in a few months. Even allowing that all the apparatus, all the raw materials, and a sufficient number of chemists were available for the creation of a large dyestuffs industry, the intricate technique and the co-ordination of all parts would still be lacking, nor could it be developed rapidly.

On October 22, the New York section of the Society of Chemical Industry in New York, held a meeting specially devoted to dyestuffs. Government officials, chemists, manufacturers, dealers and others interested in the question assembled to the number of over five hundred, and listened to papers and discussions from eminent authorities. While clearing the air of a great haze of misconception the upshot of the meeting can hardly be characterized as definite. A few points stand out prominently: The Government, while not prone to touch the question of tariffs on dyestuffs, make definite promises of strong assistance to the infant industry by prevention of unfair competition. This was brought out by a recent letter of Secretary Redfield to the Bureau of Domestic and Foreign Commerce, whose substance was reiterated at the meeting by Dr. Pratt, Chief of the Bureau.

Chemists insist that the proper support should be given to the industry. To quote Dr. J. Merritt Mat-

thews, one of the leading speakers: "Given a couple of years of continuous manufacturing of staple products, our American factories will have acquired, no doubt, as fine an art of manufacturing such dyes as the German, or Swiss factories, and other things being equal, should be able to sell on a competitive basis. It is in the equalizing of the other factors, the labor, raw materials, methods of selling and competition, etc., that our political economists, our business men and our Government must help."

The principal requirement, according to Dr. Matthews is the basis of the anilines: "In my opinion the crux of the entire question as to the establishment of an American dyestuff industry lies in the economical production of the intermediates . . . on any other basis it will be a hybrid industry, as it has been heretofore; its existence will be precarious and uncertain."

The people of the United States are evidently united in the determination to be free of German influences in the field of chemical products.

The decision will be a difficult one to follow out, and the fullest degree of co-operation between Government, chemists, educational institutions and business men will have to be brought into effect.

It Pays to Advertise

The present is an age of advertising, and, strange as it may seem to those who have been accustomed to think of John Bull as a slow, easy going individual, he has now become the world's greatest advertiser. A few years ago, when the present King returned from a trip around the world, he addressed a meeting of British business men in London, and urged upon them that they should "wake up." Since that time Great Britain has awakened, even if stern necessity was responsible for her latent activity.

When Great Britain set out to raise billions of new money for the purpose of carrying on the war, the Chancellor of the Exchequer made use of the public press to advertise the issue. The whole pages used on that occasion, together with the number of papers included in the campaign, constituted a new development in publicity. Throughout the past few months the newspapers have been used for telling the people of the need for recruits. Now John Bull is issuing full page advertisements to impress upon his people the necessity of thrift. Thus during the past year, the slow, easy-going non-advertising Britisher has set a new high watermark for publicity, and the very satisfactory returns which have resulted will probably tend to impress business men throughout the world with the value of printers' ink.

Pulp and paper men are vitally interested in advertising. The more advertising used in our papers and magazines, the more white paper is consumed, and the larger the orders which are placed with paper manufacturers. Pulp and paper men, therefore, should encourage advertising, and should set a good example by telling the world of their own product. It pays to advertise.

Lumber Camps and the Labor Market

The large number of men who have gone overseas, and those who are preparing to go, has affected the labor market. In some respects the enlistment of 150,000 men, combined with the increased activity due to war orders, and a bountiful harvest, has completely cleaned up the floating or surplus labor element. In some cases there is an actual shortage of help, and certain industries are finding it difficult to secure men.

One of the industries thus affected is lumbering. In ordinary years it was an easy matter for lumber companies to go to the big cities and pick up a floating supply of workmen, men for the most part who were accustomed to living in the open and who were willing to go into the lumber camps for a few months. Today those workmen have gone into munition camps, or have enlisted for overseas service, with the result that lumbermen and other employers of labor who only want men for a comparatively short time are finding it extremely difficult to get the required help.

This scarcity of men for the lumber camps calls attention to a problem connected with that industry. These men are sent into the wilds of the country, and for a period of some months are shut off from all contact with civilization. During recent years an effort has been made through the Reading Camp Association to improve the lot of the men sent to our lumber camps. This work, which has been carried on very largely by Mr. Alfred Fitzpatrick, has contributed in no small measure to the improved conditions which now prevail. In the olden days the lumber camps were rough in structure, and devoid of every comfort. Nowadays the modern lumber camp is not only better built, better heated and ventilated, but has a reading room and game room as part of its equipment. Here in many cases night classes are carried on, where the foreigners are taught English, men taught to read and write, taught something of the first principles of citizenship, and, in brief, an effort made to improve their condition. The work is worthy of support. Even under the most favorable conditions, working in a lumber camp is of an arduous nature, and the best that can be provided is none too good. The very nature of the work prevents lumbermen giving all the year round employment to their workmen, as is done in pulp and paper mills. Until such time as permanent work can be carried on, it is only right that some effort should be made to improve the lot of the men sent to our lumber camps during the winter months.

The Honour Roll

Members of the Pulp and Paper Industry who have Enlisted for Overseas Service

The Abitibi Power and Paper Co., Limited.

CHRISTOPHER H. "CHARLIE" DAWSON.
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WM. DONOHUE.
Corp. EARL J. WILSON.
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Lieut. GILDDEN CAMPBELL,

La Compagnie de Pulpe de Chicoutimi.

ALBERT BERNARD, seriously wounded in September.
MR. DUBU.

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EDWARD COLLINS.
ISODORE GAUDREAU.
OVILA FOURNIER.
GEORGE MORRISON.
WILLIAM CRAIG.
W. S. GOODEVE.
BARRY FRANCIS.
HERBERT LOVE.
JOHN MOORE.
JEAN DESJARDINS.

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SAMUEL MANTHORN.
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Howard Smith Paper Mills, Limited, Montreal.

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Northumberland Pulp Co., Limited, Campbellford, Ont.

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JOHN PEACE.
FRED McCARTNEY.
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V. KOZOFF.
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C. KOOBLOFF.
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HARRY PREW.

BATHURST LUMBER COMPANY LIMITED

(Written specially for the Pulp and Paper Magazine.)

Bathurst, New Brunswick is now on the map. This progressive North Shore town is proud in its possession of one of the most modern and best built sulphite and board mills in the country. The company and its engineers are being heartily congratulated on all sides for their achievement, in completing the work so successfully in record time and with a minimum of "starting up" difficulties. In spite of the exceptionally difficult circumstances and conditions since war was declared the work has progressed to completion with great rapidity. The difficulties of securing skilled mechanical, and technical help, and the slowness of deliveries have of course interfered with the work materially, and made the task considerably harder.

The Bathurst Lumber Company have been a large and successful lumbering Company for a number of years. They operate sawmills on the Bay of Chaleur both on the Quebec and New Brunswick sides. The town of Bathurst is centrally located in their large tracts of timber lands, comprising 2,800 square miles.

Their limits in Quebec are worked on three rivers, the Bonaventure, Cascepedia, and Little Cascepedia, with sawmills at Bonaventure and New Richmond. The New Brunswick limits are logged on the following rivers, Tetagouche, Little, Middle, Bass, Nigado, Elm Tree, and Nepisiguit. Two modern fast cutting sawmills on Bathurst harbor cutting four hundred and fifty thousand a day handle the lumbering end of these limits.

The Company is now centralizing their manufacturing interests more at Bathurst, and using much timber and pulp wood from the Quebec limits in their mills there.

The water powers amounting to 15,000 horse power controlled by the Company are on the Nepisiguit River almost twenty miles from the mills and will be developed later for the proposed extensions, to make 200 tons of newsprint.

The pulp and paper mills are built in an ideal location at the mouth of the Neisiguit River on Bathurst harbor and in the town proper, with rail connection immediately at the mill and deep sea shipping facilities. They represent the most modern methods and advanced engineering practice both in construction and equipment.

The entire plant has been designed, and constructed by the company itself under A. G. McIntyre Manager of Pulp & Paper Mills, assisted by A. A. MacDiarmid Chief Engineer, J. H. Thickens, General Superintendent, A. G. Hinzke, Sup't Sulphite Mill, J. G. Mayo, Assistant to the Manager, George E. West, Power Engineer, A. A. Block and J. H. Melander assistant Engineers, and Roy S. MacBeath, Civil Engineer.

The sulphite mill originally designed for twenty five tons daily capacity is now running much over normal production, and will probably turn out forty to fifty tons daily of strong bleached fibre. The logs are all made random lengths in the brisk and cut into four foot lengths in a slasher house on the river bank. The summer surplus is piled very economically by a travelling stacker. Wood for immediate use goes to the mill where it is barked by design of barking drums 8 x 30 feet, running at seven and one half revolutions per minute, in concrete tanks of warm water.

The acid plant is a stone and tank system used in Norway and Sweden extensively designed by N. K. F.

VIEW OF BATHURST LUMBER CO'S SULPHITE MILL

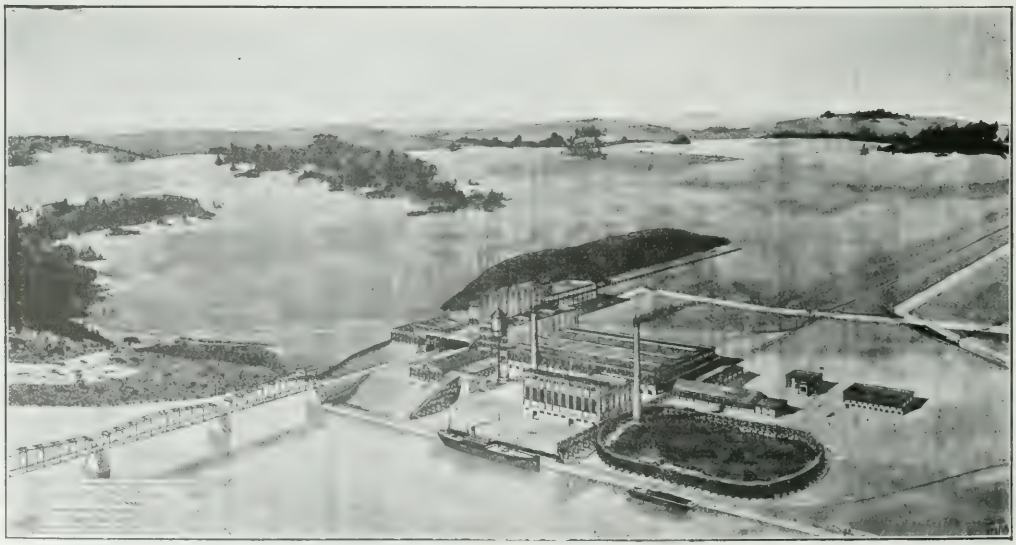
Hanson of Christiana. It is proving very successful and making excellent acid.

For the present the pulp is being shipped unbleached, but will shortly be all bleached. It has found a wide and favorable market on account of its unexcelled strength.

The container board mill of 60 tons daily capacity embodies many new ideas and patents, the chief of which are controlled by J. H. Thickens the General Superintendent. The chips are steamed with a small percentage of caustic, blown into blow pipes and treated by kollergangs. From here the stock goes to the large double beaters with a lava stone and a steel roll. This stock gives a very strong container, with fine bending qualities and is made waterproof by a patented sizing process.

The equipment is as follows:

Babcock & Wilcox boilers.
Taylor Automatic stokers.
Jeffrey coal handling equipment.
Foster superheaters.
Westinghouse generators and steam turbines.
Westinghouse condensers and pumps.
Terry boiler pump steam turbines.



BATHURST LUMBER MILLS

Westinghouse switchboard, transformers & switches.
M. W. Kellogg Co., high pressure piping & fittings.
Cochrane metering water meter & feed water heater.
Black Clawson Co., sulphite drying and board machines.
Wm. Hamilton Co., barking drums.
Waterous, stacker.
St. John Iron Works, slasher and log jack.
Boving pumps and kollergangs.

ONE OF THREE YARDS, BATHURST LUMBER CO.

J. Max & Co. double beaters.
Black Clawson stuff pumps.
Waterous flat screens.
Westbye centrifugal screens.
(3) Manitowoc digesters 8 x 50'.
(2) Portland digesters 17' x 50'.
(2) Carthage chippers.
(2) Lombard crushers.
Ryther & Pringle shake screen.
Sturtevant, heating and ventilation.

MACHINE ROOM BATHURST LUMBER CO.

Canadian General Electric motors.
Scott caustic plant.
Sherbrooke wet machines.
Hinzke bleaching system.
Process engineers sizing system.
Canadian Kellogg Co., mill piping.
T. McAvity & Sons, bronze.
Gutta Percha & Rubber Co. belting.
St. John Iron Works, transmission and conveying machinery.
Dillon jordons.
Seybold cutter.
Dominion Bridge Co, structural steel.
Barrett Mfg. Co. roofs.
Roots vacuum pumps.

A great problem in the design of the mill was the fresh water supply, since the mill was situated on salt water. It was necessary to bring this three miles, crossing the main Nepisiguit in twenty feet of water, a twenty four inch line handles seven and a half million gallons a day to the mill. Conservation of white water has been arranged in every possible way.

From an engineering standpoint the mill represents the best in efficiency and economical construction, and is now making a strong sulphite much sought for by paper manufacturers.

MR. ANGUS McLEAN
President Bathurst Lumber Co.

A RECORD OF THIRTY YEARS.

"A very rough but conservative estimate based on the general average of saw-timber production of the forest patches as existing, shows that during the last 30 years, over the territory examined, the Dominion of Canada has lost through fires about 16,000,000,000 feet, board measure, of merchantable spruce and pine timber, which at 50 cents per 1,000 feet would represent the enormous sum of $8,000,000. Besides, what about the prospects for the future throughout the same territory? These figures are not given as absolutely exact, they are as near as possible to the truth, and although very conservative they have the advantage of showing effectively and correctly the results of unchecked fires, and the destruction and waste which are the lot of our unprotected forests."

The moral, of course, is that we should get in and protect our forest areas in advance of the prospector and pioneer, so that when the settler arrives there will be timber for his buildings, ties for the new railways and fuel for all.—Canadian Forestry Journal.

THE USE AND CARE OF THE MICROSCOPE

By E. SUTERMEISTER.

(Written Specially for Pulp and Paper Magazine.)

In a recent article* some of the possibilities of the microscope in the paper-making field were discussed. The present paper is intended to present a few facts about the construction, use and care of microscopes and accessories, and also methods and formulas which are useful in the paper industry. As the subject of microscopic manipulation is one of considerable importance it will be possible to discuss it only briefly in an article of this kind, but if the reader desires further details he is referred to the list of standard works at the end of this paper.

Simple Microscopes are those which consist of a single lens or a combination of lenses, usually in close contact, acting as a single lens. They are generally called magnifiers, and are most often mounted in metal or hard rubber fittings, so that they may be conveniently handled or carried in the pocket. Belonging to this class are the ordinary reading glass and the types illustrated in figures 1 to 4 which show a few of the various mountings.

Simple microscopes generally consist of a single lens of the convex type, but the best of them, as illustrated by the aplanatic triplets are made by cementing two concave-convex lenses of flint glass to a double convex crown glass lens. This combination gives a clear field with comparatively long focus and very little spherical or chromatic aberration.

Microscopes of this type have magnifying powers of two to twenty diameters, and can therefore be used only in investigations requiring comparatively low magnification. The manner of use depends on the form of the lens, and the nature of the work in hand, but no special instruction is necessary provided the user is endowed with common sense. The one precaution which it is well to emphasize is to keep both eyes open; nothing looks more absurd than the facial distortions incident to the attempt to keep one eye closed and moreover, closing one eye has no advantage. At first the observer will doubtless be considerably annoyed by objects seen with the unoccupied eye, but after only a little practice it will be found that they are totally ignored.

The type of simple microscope which it is best to purchase depends largely on the kind of work to be done, and on whether it is to be carried in the pocket or not. For the lower powers one of the cheaper instruments will be found to answer all requirements, but for the higher powers the writer has found nothing so satisfactory as the aplanatic triplet. In selecting an instrument it is to be recommended that a number of different types and magnifying powers be obtained on approval, and tried out on the actual work which they are to handle. Only in this way can an intelligent selection be made, and there is usually no trouble in obtaining goods on approval from any reputable dealer provided satisfactory references are given. For those unfamiliar with optical goods it may be stated that the cost of simple microscopes varies according to the kind and the magnification from 50c to $7.00, but that it is usually undesirable to go to either extreme.

The Compound Microscope, a standard type of which is shown in figure 5, consists optically of two lenses, or series of lenses, so arranged that the observer sees a magnified image of the object, and not the object itself.

The parts of a modern compound microscope include the base to which is attached the pillar. This pillar is divided into two parts by a joint and to the upper part is fixed the stage, which serves to support the objects to be examined. The stage also supports the sub-stage, which is a device for holding various accessories as condensers, diaphragms, glass discs, etc. The arm which holds the body of the microscope is fitted to the upper end of the pillar; to this arm are also attached the coarse, and fine adjustments for the approximate and final focussing respectively. The tube, or body, rests upon the arm, and in this fits accurately the draw-tube which carries the eye-piece at its upper end. This tube is marked on the outside to show the distance to which it has been withdrawn. At the lower end of the body is a narrow part called the nose-piece, into which the objectives fit; this may be single, double, triple or quadruple, to carry from one to four objectives, any one of which can then be swung into place instantly. The diaphragm, already mentioned in connection with the substage, is a device for controlling the amount of light which passes through the object under examination. It is one of the most essential parts of the compound microscope, and by far the best type is that known as the iris diaphragm which permits of any adjustment between the two possible extremes.

Besides these mechanical parts there are the optical parts, which include mirrors, condensers, objectives and oculars or eyepieces. The mirrors, usually a plane and a concave mirror in one sitting, are mounted on a bar below the stage, and serve almost wholly for obtaining transmitted illumination of the object on the stage. The condenser, which is mounted in the substage, is for the purpose of concentrating the light for the illumination of objects. It is highly essential with high power objectives, but not so necessary for low powers. The objective, which forms the real image of the object under examination, consists of several lenses or sets of lenses in a casing, which screws into the nose piece. It is much the most important part of the microscope, and in the case of the higher powers is also the most expensive part, since the distinctness of the image depends on the accuracy of its construction. The magnification of objectives ranges from 3 to 150 diameters, and their rating, or the equivalent focal length of a single lens, from 3 inches to 1-6 of an inch. For use as oil immersion lenses high powers up to 1-20 of an inch have been made, but they need not be considered here as they are not essential for paper mill work.

A microscopic outfit which should serve all purposes in the paper mill was described in a previous paper, but if low magnification only is to be used a

*Pulp and Paper Magazine, Sept. 15, 1915, p. 479.

binocular microscope will perhaps prove more satisfactory than the usual type. This will enable both eyes to be used, but its chief advantage lies in giving a stereoscopic effect. Binocular microscopes are not efficient at magnifications of over 100 diameters.

Manipulation and Care.

A thorough knowledge of the care and manipulation of the compound microscope is fully as essential to good work as is familiarity with its mechanism and optics. If properly handled a well-constructed microscope is a durable instrument, but it can be very quickly put out of commission if improperly treated; a good rule to follow is never to touch any part of it until its mechanism is well understood.

In working with the microscope it should be placed on a solid bench or desk, which is free from vibration. The pillar of the instrument should be toward the worker, and the body can be either vertical or slightly inclined. A vertical body gives a horizontal stage which is of advantage when examining objects mounted in fluids, and also does away with the necessity of using clips to hold the slides in place. A slightly inclined body on the other hand is more restful for the worker, and often allows more satisfactory illumination.

The best light for microscopic work is that reflected from a white cloud and coming through a window with a northern exposure. If a window facing south must be used translucent linen shades may be employed to give reflected light. Under no circumstances should direct sunlight be used. If it is necessary to use artificial light, acetylene, incandescent gas burner, or electric light will be found satisfactory. Oil and gas lights are less convenient because of their yellow tint; this can, however, be largely overcome by the use of colored glass discs in the substage ring. If a flat flame of oil or gas has to be used its edge should be turned toward the mirror, as this gives greater intensity and more nearly parallel rays. Whatever source of illumination is used it should be so adjusted that no glare enters the unoccupied eye.

After selecting the source of light the next step is to secure the brightest illumination of the field of view. With the microscope in the position in which it is to be used, place the eye at the ocular and adjust the mirror by swinging on both axes until the field appears brightest. With artificial light it is sometimes more satisfactory to remove the ocular and look down the tube until the light is properly centred. When an Abbe condenser is employed it is the rule to use the plane mirror, but when the light comes from a window with small panes an image of the window bars is sometimes obtained. In this case the concave mirror may be used, but it will be necessary to close the iris diaphragh about two-thirds and lower the condenser.

The amount of light passing through the object is controlled by the substage diaphragm. A frequent mistake is the use of too much light; this not only injures the eyes, but renders invisible many of the details of the object under examination. As a general rule it is best to use as little illumination as will clearly and distinctly show the structure which is being studied.

Focusing is adjusting the distance between the object and the objective, so that a clear image is obtained. This must be done without danger to the lens or the object by their coming in contact, and to this end most authorities recommend that the objective be lowered to less than its focal distance from the object, and then gradually raised by the coarse adjustment while looking through the ocular. When the image appears final focusing should be completed with the fine adjustment. This method insures the safety of both lens and object, but it is awkward and in most cases unnecessary, as with an equal amount of care focusing downward is fully as safe with objections up to 1-6 inch rating.

The effect of microscopic work on the eyes is often misunderstood. With proper illumination, clean lenses and the employment of common sense the use of the microscope should strain the eyes no more than reading ordinary print. If a contrary result is noticed it is an indication of ignorance of proper manipulation. It is claimed that if glasses are worn for reading they should also be worn for microscopic work| With high powers this is hardly possible, since in some cases it is necessary to place the eye so near the ocular that the eyelashes actually rest upon the lense.

The care of a microscope may be briefly set forth in a few general rules as follows: –

(1) When not in use the instrument should be kept in its case in a dry place where it is not subject to sudden changes of temperature.

(2) The stand should be kept clean and free from dust; metal parts may be wiped with clean linen or cotton cloth.

(3) Oculars may be cleaned by means of soft, well-washed linen or by lens paper made for that purpose. At intervals the inner surfaces of the lenses should be cleaned as a film tends to form on them, which makes the image cloudy.

(4) Objections should never be taken apart even though they can be unscrewed. The front lens may be cleaned with linen and the rear surface freed from dust by means of a camel's hair brush.

(5) Never allow mounting fluids or chemical reagents to come in contact with any part of the instrument. This applies with greatest force to objectives which are often ruined by insufficient attention to this precaution.

(6) All movable parts, such as gearings, sliding adjustments, screws, etc., require cleaning from time to time. For doing this use a little xylol on a soft linen cloth and afterwards rub on a little vaseline as a lubricant.

(7) In carrying the instrument hold it by the pillar or stage. The arm is more convenient, but also more likely to injure the fine adjustment.

Accessories.

For the greater part of the work connected with paper making, no accessories will be needed beyond slides, cover glasses, forceps and needles. The further one goes, however, the more desirable it will become to have some of the auxiliary equipment, and for this reason the more important accessories will be briefly mentioned.

Slides of thin plate glass, three inches long by one inch wide, are used to hold the objects to be examined under the microscope. They should be made of a good quality of white glass, free from air bubbles and other defects, and the edges should be ground. It is desirable to have the different slides of the same thickness, but they are seldom uniform, as received from the dealers. In case of necessity slides can be made from

ordinary window glass, or even cut from a good quality of mica with a pair of shears.

Cover-glasses are very thin pieces of glass which are placed over the object on the slide, and serve to flatten and protect it and to hold the mounting media in place. They should be made of good glass, and be free from air bubbles and all irregularities in surface or refraction. Cover glasses are made either circular or rectangular, and of various sizes from ½ inch to 1 inch in diameter. The selection of shape and size depends largely on personal preference, the writer has found circular covers ¾ inch in diameter to be very convenient.

The thickness of cover glass has a very great influence on the definition obtained with any objective. This is hardly appreciable with low powers, but when a 1-6 or ⅛ inch objective is used a variation of 0.05 m.m. is sufficient to obliterate the fine lines of the object. As it is commercially impossible to produce covers of our thickness it is best to measure them and set them aside for high power work those which are of the thickness for which the objectives employed have been corrected. The importance of this point is not very generally understood.

Needles are extensively employed in microscopic work for arranging the obects on the slide, teasing out fragments, etc. As sold by dealers they are usually mounted in bone handles from which they can readily be removed for cleaning or replacement. Such holders frequently break or get out of order, and an entirely satisfactory substitute can be made by forcing a stout sewing needle, eye first, into a handle whittled from a bit of pine board.

Forceps about four inches long, with fine, curved points will be found very convenient in handling small samples, cover glasses, etc. Micrometers, which are used for measuring objects examined under the microscope, are of two kinds, stage micrometers and eye-piece micrometers. The stage micrometer generally consists of a circle of glass upon which is ruled one millimeter divided into one hundred equal parts. This is mounted on a glass or metal plate and used on the stage for comparison with the eye-piece micrometer, which is the one actually employed in making the measurements. The eyepiece micrometer is a glass disc which rests on the diaphragm in the eyepiece, and on which are ruled lines at equal distances apart. The value of these divisions must always be determined by comparison with a stage micrometer, hence the number of divisions, and within certain limits, their magnitude is unimportant. After determining the ratio between the stage and the eyepiece micrometers, the object to be measured is substituted for the former, and the number of divisions of the eyepiece which it covers, multiplied by the appropriate factor will give its size.

The value of the eyepice micrometer varies with each instrument, with each combination of lenses, and for varying lengths of draw-tube. It must therefore be determined in every case by comparison with a stage micrometer.

A mechanical stage, which can be clamped to the aim of the microscope, is of very great convenience at times in making a systematic survey of the object. It holds the microscope slide upon the stage and by means of rack and pinion moves it in any direction. One form of such a stage is shown in figure 6.

The use of polarized light is occasionally very desirable, particularly in examining starches and crystals. To obtain results with polarized lights both a polarizer and an analyzer are required. The former is mounted to fit in the substage setting and the latter either just above the objective or above the eyepiece. The methods employed and the results obtained with polarized light cannot be adequately dealt with in an article of this nature; the desired details may however be obtained from any good textbook on microscopy.

The camera lucida is a contrivance which may be attached to the upper end of the microscope tube and which enables the worker to see the image of the object on a sheet of paper. Its use aids in making drawings of the objects examined. There are many types of this device, one of the simpler forms being shown in figure 7. Even the best camera lucidas have objectionable features and many workers never use them.

Instead of drawings made with the camera lucida actual photographs should be substituted whenever possible. Many photomicrographic outfits are on the market, all of which are quite expensive, but their use is not all essential to good work. An ordinary camera placed in line with the microscope, which is a horizontal position, will do most excellent work. Good illumination can be obtained from a Willsbach burner and a double convex lens to act as a condenser, in which case the mirrors and Abbe condenser are not used. With a little practice anyone who is familiar with photographic work can obtain good results.

The subject of microtonies for cutting sections is one with which the paper-mill chemist need seldom concern himself so that it may be passed over briefly. For simple work a section razor, flat on one side and concave on the other, will be found convenient, while for more extensive operations one of the numerous automatic microtomes should be employed. These are rather expensive instruments and should never be included in an outfit until the need of one has been well demonstrated.

Reagents and Methods of Testing.

Of microscopic reagents for various purposes there is no end, but the writer believes that a list of such reagents is of very little value to most chemists. It is seldom that any two problems presented to the chemist of a paper mill are just alike so that each one has to be considered separately and accorded a different treatment. A good basic knowledge of the reactions which different materials undergo will enable any well trained chemist to select the reagents best suited for demonstrating any substance.

Moreover many reagents must be used in different strengths for different purposes if good results are to be obtained. Take the case of the iodine for instance; in various strengths of solution it may be used to distinguish starch from other materials, to show the markings on starch grains, to stain cellulose fibres for paper analysis, to demonstrate the presence of caseine in paper, etc. It would be undesirable to list or keep on hand iodine solutions of suitable strength for each of these purposes, nor is it at all necessary for the experienced worker. Further discussion of reagents and methods will therefore be confined to those used in the analysis of paper for fibres, which is one of the demands most frequently made on the chemist.

The procedure is comparatively simple, and one needs only patience and practice to become reasonably expert. The first requisite is to reduce the paper to a

pulp so that the fibres may be readily separated for examination; this is easily accomplished by boiling a small piece in a test tube with a little 1 per cent caustic soda solution, washing out the alkali without breaking up the paper and then rolling the latter between the thumb and finger for a few seconds. If it is then returned to the test tube and shaken vigorously with a little water it will at once break down to a pulp which is free from lumps of unreduced paper and from which a representative sample can be easily obtained with a needle. This small sample is placed on a microscope slide and the water removed by pressing with a blotting paper, when it is then ready for staining.

The object of staining is two-fold — to make the structure of the nearly transparent fibres more distinct, and to differentiate the various kinds of fibres by the colors produced. The stains which have been used for this purpose generally depend on iodine as the active coloring matter, and this is usually combined with, or followed by, some other substance to develop the different colors. Two of the most commonly used are iodine with sulphuric acid and iodine with zinc chloride, but while these give good colors they are corrosive, tend to dissolve the fibres, and must be used with caution. A stain which is free from these defects consists of two solutions as follows:—

No. 1.—15 grams iodine and sufficient potassium iodide to effect its solution, made up to 1000 cc.

No. 2.—A clear, saturated, solution of pure calcium chloride.

This combination has been used with entire satisfaction for a number of years by the writer, and is strongly recommended. In using it, a drop of the iodine solution is placed on the fibre, on the microscope slide, previously dried as much as possible by a blotter; after it has thoroughly saturated the fibre, the blotter is again applied with a firm pressure, to remove all excess of stain, and a drop of the calcium chloride solution is then added. The fibre is then worked over and teased out with the needles till all lumps are reduced to a uniform pulp and then a second 3 x 1 slide is placed over the first. In doing this it is well to have its convex side down and to drop it on to the preparation from a height of about half an inch, instead of lowering it slowly; if dropped suddenly it is much easier to produce a field of uniform and satisfactory fibre density for the subsequent examination.

The colors produced by this combination stain are quite characteristic, and while no two observers would classify them just alike they may be described as follows:—

Red brown: rag stock including cotton, linen and hemp.

Dark blue black: Soda fibre produced from broad leaved woods such as a poplar, birch, gumwood, etc.

Violet: Bleached sulphite spruce.

Yellow: Ground wood.

Greenish yellow: Jute manila and some of the fibres in unbleached sulphite.

As will be seen, the highly lignified wood takes a yellow color, while jute and manila, from which the incrusting matters have been partly removed still retain enough to give a yellowish shade. This is true also of some of the less thoroughly cooked fibres in unbleached sulphite, derived doubtless from the denser and more resistant summed wood. This characteristic staining of some of the fibres makes it possible to determine the presence of unbleached sulphite in a paper, though it will not permit an estimation of its amount.

These distinctive color reactions, together with the various forms of the fibres, enables one with a little practice to estimate the percentages of the various constituents to within about 5 per cent. It is useless to expect much greater accuracy, but this is close enough for all practical purposes. For the beginner it is quite essential to prepare a collection of the kinds of fibres in most common use, and it is also very desirable to have a set of mixtures made up of different proportions of the beaten fibres. Such mixtures should be used for comparison with the unknown samples till the observer becomes skilled enough to make an accurate estimate without them, and even after this skill has been attained, they are useful in refreshing one's judgment, and il all cases where especial accuracy is demanded.

In addition to the color of the bres and their shape and size, as distinguishing characteristics, there are present in the pulp from all broad-leaved woods large cells open at the ends and variously marked on their walls. It would be useless to attempt a description of all these cells, but they are different enough in many cases so that it is possible to tell the kind of wood and by inference the general section of the country in which the paper was made. Thus it is easy to distinguish in a paper the presence of gumwood pulp, tulip tree fibre, etc., and it is a safe guess that such papers were not made in Canada or the northern part of the United States.

Unfortunately this stain will not differentiate between sulphite and sulphate fibre, which at times is a rather important point to determine. Here we have to depend on the form and markings of the fibres, since sulphate is usually prepared from pine, the fibres of which have nearly square or rectangular holes through their walls, while sulphite, generally made from spruce, is characterized by circular bordered pits only. Il the sulphate proceess should be applied to spruce, as it is occasionally, this difference would vanish so that any statement as to the presence or absence of sulphate fibre must be considered as little more than an intelligent guess.

Reference Books.

Schneider: Microscopy and Micro-Technique 1899.
Chamot: Elementary Chemical Microscopy 1915.
Emich: Lehrbuch der Mikrochimie 1911.
Gage: The Microscope 10 edition, 1908.
Winton: Microscopy of Vegetable Foods 1906.
Hanausek-Winton: Microscopy of Technical Products 1907.
Cohu: Tests and Reagents, Chemical and Microscopical 1906.

LIEUT. W. D. DEAS KILLED.

Lieut. W. D. Deas, well known to the paper trade throughout Ontario and Quebec, was killed in action a short time ago. Lieut. Deas was an officer in the 11th Argyle and Sutherland Highlanders, going back home to serve with his old regiment shortly after the outbreak of war. In Canada he was employed as Ontario traveller by the well-known Montreal wholesale stationery firm of McFarlane Son and Hodgson. Lieut. Deas had the happy faculty of making friends, and the many who knew and respected him for his sterling qualities will know that he cheerfully and fearlessly "did his bit" for King and Country.

Fall Meeting Pulp and Paper Association

The fall meeting of the Technical Section of the Canadian Pulp and Paper Association will be held in Montreal on Friday, November 19. The headquarters will be the Forest Products Laboratories of Canada, 700 University Street (Telephone Uptown 6983.)

(The Council has arranged a programme which will be of real interest to the technical men of the industry. The business session will begin at 9.30 a.m., in the conference room at the Laboratories. The reports of the various committees will be of vital importance to all and we shall look for much useful discussion which will help the committees in their efforts to develop the pulp and paper industry. (The Committees on Standards and Methods of Testing, Literature and Statistics, Technical and Collection of Paper Samples have been active and are anxious to have the support of all the members.)

We shall take luncheon together and have a chance to become better acquainted with one another.

The afternoon session for the reading of technical papers will begin at 2.30 p.m. Dr. Bjarne Johnsen, who has recently joined the staff of the Forest Products Laboratories, will discuss his research work in Europe on "Chemical Analysis of Wood Pulps." Mr. Fred Barnes, chemist with the Belgo-Canadian Pulp and Paper Company, Limited, will read a paper on "The Testing of Papermaking Materials." Mr. J. A. DeCew is planning to talk on "Recent Disturbances in the Field of Papermaking Supplies." It is expected that a thorough discussion will follow each paper. Arrangements for the evening will be taken up at the morning session.

The membership of the Section is now over 40 and should pass the 50 mark by the time of the meeting. Application forms have been distributed among the mills and more may be had from Roy L. Campbell, Secretary. (Members should make a special effort to bring the Section to the atttention of other technical men in the industry). The Chairman feels that a motion should be introduced providing that dues already paid and those paid during the balance of the year will cover membership for the calendar year 1916.

Members of the Technical Section are urged to attend the fall meeting, and a cordial invitation is also extended to all those who, though not yet members of the Section, are interested in the work which we are doing.

JOHN S. BATES, Chairman,
700 University Street,
Montreal, November 11, 1915.

BEAR RIVER PLANT RESUMING.

The pulp mill of the Bear River Paper Co. at Petoskey, Mich., is resuming operation this week, having installed a hydraulic press and pump for use in the preparation of its bleached sulphite pulp for shipment. Under the new operation the entire output of bleached sulphite will be sold to mills that use this furnish, but who do not produce it themselves.

The November output has already been sold, and a proportion of the annual production has been contracted for. The mill will do its own selling.

The Abitibi Power and Paper Company

The Abitibi Power and Paper Company recently invited a number of bankers, brokers, paper manufacturers and newspaper men to visit their new plant at Iriquois Falls, in Northern Ontario.

The paper mill, which has been in operation since July, is able to produce nearly two hundred tons of newsprint per day. The pulpwood is largely supplied from settlers, although the company possesses large tracts of valuable pulp lands.

MR. F. H. ANSON,
President Abitibi Power & Paper Co.

In addition to the newsprint produced, the company are developing 22,000 horse power, and are also producing large quantities of ground wood and sulphite. The plant cost in the neighborhood of four and a half million dollars, and gives employment to several hundred workmen.

B. C. LUMBER IN AUSTRALIA.

The Hon. W. R. Ross is advised by the Department of Trade and Commerce at Ottawa, that the exhibits of British Columbia recently sent to Australia are being shown at the Royal Exchange, Sydney, and will afterwards be featured at an approaching architectural exhibition. The Canadian Trade Commissioner at Melbourne, to whom the exhibits were consigned, is arranging for timber importers, builders and others who are interested to view them, and reports that the varied and beautiful finish which British Columbia Douglas Fir takes has been the subect of considerable comment. It will be remembered that a number of these exhibits were sent abroad earlier in the year, and, as in the case of the Sydney display, have attracted much attention in the important trade centres at which they have been placed.

Bamboo as a Source of Pulp

In view of the fact that some attention is being given in Trinidad to the utilization of the bamboo as material for paper-making, considerable interest attaches to a communication made by Mr. William Raitt, cellulose expert, Imperial Forest Research Institute, India, to the English International Congress of Applied Chemistry. In the article under consideration it is stated that it has been proved that bamboo cellulose is suitable for the manufacture of paper, especially for the printing and litho grades, provided its isolation has been successfully accomplished. Previous to the investigation with which the article deals, some divergency of opinion existed in regard to the possibility of utilizing nodes and certain operations connected with isolation.

The writer refers to Mr. R. S. Pearson's work in connection with the species of Bambusa suitable for paper-making material in India and Burma. Out of some hundred different species, only five were found to be suitable, namely, B. Tulda, B. arundinacea, B. polymorpha, B. (Cephalostachyum) pergacile, and B. (Meloconna) bambusoides. These are the only species which exist in commercial quantities and under economical conditions. Though few in number, these species are each so dominant in its own area that they probably represent 80 per cent of the whole growing stand of bamboo in the country.

The point next dealt with is the difficulty of distinguishing bamboo stems of different ages. The writer then proceeds to consider the digestion of the stems. It is stated that the material has an undesirable tendency to float. Its resistance to penetration and the variation of this in accordance with the size of the chip is indicated. Also there is the variation in this respect in accordance with age, a charge of mixed age being invariably irregularly digested.

A bamboo column is light and buoyant solely because it is hollow. Its component wood is really as heavy as many of our commercial hardwoods. Its actual specific gravity varies somewhat with species, that of the lightest of the five species we are concerned with being .8.410 for internodes, and .8.091 for nodes, while the heaviest is .9.555 for internodes, and .9.170 for nodes. Bamboo is, therefore, of about twice the specific gravity of the common pulp woods, spruce and fir—a fact which when realized in all its bearings, throws considerable doubt as to whether we have been right in treating it on similar lines as wood so far as its preliminary preparation for digestion is concerned.

A marked microscopic feature of bamboo is the large vessels which run continuously from top to bottom of the stems. These do not collapse in drying, but retain their full size and shape, and consequently their air-drying capacity. Dry bamboo is, therefore, largely impregnated with air in a state of capillarity—a condition which makes it somewhat difficult to expel, and which fully accounts for the tendency to float, which is one of the chief difficulties in its digestion. Digestion difficulties are, therefore, due to resistance of the capillary air and to a mass of structural resistance to penetration of liquor varying with the size of the individual chip. The smaller the particles and the more regular their size, the better will be the results. Some light is thrown upon resistance by chemical examination of the stem. It was found that lignification begins with the sprouting of the branches, which occurs when the culm is three-fourths grown, and is complete at one year old, little or no change in this respect happening afterwards. At the half grown stage, the plant is wholly pecto-cellulose in character. With the rapid increase in lignin at maturity, there is a corresponding reduction in pectose, but with advancing age a gradual increase in the latter at the expense of the starch group. The plant is distinctly of a pectoligno-cellulose character.

The investigation into the amount of caustic soda needed for digestion showed that the whole stem, nodes included, when suitably crushed, will digest satisfactorily with a theoretical $17\frac{1}{2}$ to 18 per cent of caustic soda, and it makes no difference whether it is one or three years old; and in the produce there is absolutely no indication whatever of the nodes. It is pointed out that under normal conditions of digestion, pectose gelatines, and probably resistance is set up; but crushing counteracts such action in the case of bamboo.

One of the remaining difficulties is connected with the starch content of the plant, and its effect upon yield of cellulose and also on the bleaching results. It was found that starch in the bamboo is capable of being oxidised by air and dispersed in the atmosphere, and that such oxidation is an integral part of the process of seasoning. This has led to the conclusion that the maximum yield of cellulose can only be obtained from bamboo which is not merely dry, but is also seasoned. The influence of the starch content upon bleaching is due to the results of the combination between it and caustic soda which occurs under the digestion condition of strong liquor and high temperature. This does no harm if it were not for the fact that the secondard starch contains an insoluble dark-brown precipitate, which is unbleachable within economic limits. This was removed satisfactorily by means of the sulphite proces. A 1 per cent solution applied in simple cold steeping to the unbleached pulp produced by caustic soda, dissolved out of it a large quantity of dark-brown colouring matter, leaving it several shades lighter in colour and much more bleachable.

In conclusion, the objections that have been made to bamboo as a paper-making material, and the difficulties hitherto met in their treatment as described in the above article can be met in the following ways: (a) seasoned bamboo only to be used; (b) raw material to be crushed; (c) water soluble matter to be extracted previously to digestion; (d) digestion with sulphite liquor. It is pointed out that the foregoing refer only to the five species of India and Burma, and may not prove altogether applicable to the bamboos of other species grown elsewhere.—The Agricultural News.

WOOD PULP REQUIRED IN ITALY.

The Department of Trade and Commerce have received a cable from Mr. Watson, Trade Commissioner in London, from a firm in Milan, Italy, who wish to import large quantities of wood pulp and cellulose for paper works. If Canadian shippers interested wire Mr. Harrison Watson, stating merchant prices c.i.f. Genoa, he will repeat to Milan. Should exporters desire to communicate direct with the firm in question, the name of the company may be obtained on application to the Department of Trade and Commerce, Ottawa. (Refer File No. A-1107.)

Ottawa Notes

Ottawa, Ont., Nov. 14.

The E. B. Eddy Company of Hull, has closed down its sawmill for the winter. A number of men have thus been placed out of work, but the company is employing a certain number of these on repair work, and states that the present complement of men employed in the varfious mills, numbering about 1,300, will be kept on all winter.

The J. R. Booth Company will also employ the majority of hands now at work, through the entire winter, in the pulp and paper end of its business, though its sawmills, of course, ceased operations some time ago. At the Smart-Woods bag factory a full staff is being maintained, while some departments are working overtime as a result of war orders.

An influential deputation from Quebec City waited on the Government a week ago and asked for lower freight rates over the National Transcontinental Railway to Quebec. Lower rates on pulp and paper were requested among other revisions, the delegation backing up this request by pointing out how many large pulp and paper industries were now in operation along the N. T. R. After stating that the first hundred miles of the line westward from Quebec passed through a fertile agricultural district, they added that "t'he next 200 miles follow the Valley of the St. Maurice, whose spruce forests and great water powers have created vast paper and other industries, involving a capital expenditure of $48,000,000, and giving employment to nearly 88,000 men, and the Government is now expending on this river $1,500,000 to increase the water-power.' The deputation thought that Quebec was at present discriminated against as regards rates in favor of Montreal.

According to a statement issued by the Canadian Forestry Association last week, compiled with the assistance of the Dominion Forestry Branch, and Provincial Departments, Canaad, during 1915, lost over $10,000,000 worth of her forests through unnecessary fires. In face of the fact that the forest resources of the country are within measurable distance of depletion through the enormous annual waste, the 1915 depredations are sufficient to cause grave concern. More than 12,000 forest fires, large and small, occurred in Canada during the past spring, summer and fall, or an average of 1,400 a month between snow and snow. In Ontario, Quebec and New Brunswick about 85 per cent of the losses were due to settlers' fires. Quebec and British Columbia have secured splendid results from their "permit" laws. New Brunswick has already made a good start in the regulation of settlers' fires. Manitoba lost more than $1,000,000 in damage to mature timber and young growth in 1915, the total area burned being over 800,000 acres. Saskatchewan had a burned area of 160,000 acres, and a total loss of $170,000. In Southern Alberta only 25,000 acres were burned, at al oss of about $25,000, but in the northern part of the province 500,000 acres were burned over at a loss, however, of about $200,000. In British Columbia about 10,000 acres of logged-over land was burned, but the fires were kept out of the merchantable timber. In all these fires, in fact, it was probably pulpwood which suffered most.

Mr. George Millen, president and general manager of the E. B. Eddy Company, celebrated his 77th birthday recently. The occasion was not allowed to pass by the employes of the Eddy concern, who held a special concert in the Eddy fire hall in Mr. Millen's honor, presented him with two highly eulogistic addresses, a handsome silver smoking set, and seventy-seven American Beauty roses. Mr. Millen has been in the service of the Eddy Company for over fifty years, and fitting reference to this long connection with the interests was made. The spirit of co-operation between employer and workman was the keynote of the president's reply. He told his assembled employes that present conditions were not favorable, thta it was difficult to get a remunerative price for what the company was manufacturing, but that with the continued assistance of his hearers the company would endeavor to pull through the war with the least disturbance of its relations with its employes.

Nineteen more settlers have been fined recently at Nominingue, Que., in persuance of the Quebec Government's policy of making examples of those settlers who cause loss to timber through carelessness in starting fires. Evidence was furnished in these cases by the Lower Ottawa Forest Protective Association, to which all the local pulp and paper firms belong.

MAC.

B. C. LUMBER OUTPUT.

According to the timber returns for the month of September, issued by the Minister of Lands, British Columbia, the total output of sawlogs for the Province, as shown by the scaling figures, amounted to 92,080,493 feet board measure, while 361,911 lineal feet of poles, piles, and props, together with 29,312 cords of railway ties, fence posts, shingle bolts, etc., were also scaled for royalty during the month under review. The figures for the Vancouver district were 53,001,924 feet board measure sawlogs, 14,394 lineal feet piles, etc., and 16,264 cords ties, bolts, etc., the Island district contributing 5,307,218 feet sawlogs, in addition to 2,520 lineal feet piles. In the Prince Rupert district there were scaled 954,135 feet sawlogs, while the totals under the same heading for the Cranbrook, Nelson and Vernon districts were respectively 21,595,575 feet, 7,135,290 feet, and 3,349,603 feet. Poles, piles and props to the total of 328,304 lineal feet were scaled in the Nelson district, and in the Cranbrook division to the total of 15,013 lineal feet.

Timber sales recorded during September cover an estimated total of 7,338,000 feet sawlogs, and 3,030 cords of shingle bolts, estimated to produce a total revenue of $12,876.

READING CAMP ASSOCIATION.

During the past month the Secretary of the Canadian Forestry Association arranged with the Reading Camp Association, of which Rev. Alfred Fitzpatrick is superintendent of camp education, for the distribution of from thirty to fifty copies of the Canadian Forestry Journal each month in the reading tents maintained by that body. Other literature on forest questions of a helpful, educative kind will be supplied the Reading Camp Association as it is issued.

Cork Trees of Spain

An important industry in Spain is the cultivation of cork trees. This tree is an oak which grows best in the poorest soil. It cannot endure frost and must have sea air and also some altitude. It is found all along the coast of Spain, the northern coast of Africa and the northern shores of the Mediterranean.

There are two barks, the outer of which is stripped for use. The cork is valuable according as it is soft and velvety. When the sapling has reached the age of ten years it is stripped of its outer bark for two feet from the ground. The tree will then be about five inches in diameter and about six feet up to the branches. This stripping is worthless. The inner bark appears blood red, and if it is split or injured the tree dies.

When eight or ten years more have elapsed the outer bark has again grown, and then the tree is stripped four feet from the roots. This stripping is very coarse, and is used to make floats for fish nets. Every ten years thereafter the bark is stripped, each year two feet higher up, until the tree is forty or fifty years old, when it is in its prime, and may then be stripped every ten years from the ground to the branches.—Exchange.

LUMINOUS WALL PAPER.

Inside of three years you'll have no use for gas or electricity for lighting purposes.

That's in accordance with the prediction which was recently made by Prof. Montraville Wood, one of the country's foremost scientists, in the course of his address at the Chautauqua, Kalamazoo, Mich.

"If science makes as great progress during the next three years as it has during the past three years, in the matter of the discovery of radio-active materials, it will be possible to secure material with which to paper our walls, which will store up enough light to make artificial light unnecessary at night," he declared.

Prof. Wood is a scientist who has many honors to his credit and he speaks with authority concerning the topics which he touches in his addresses.

JAPAN WANTS WOOD PULP.

There has been an improvement in the Japanese demand for Canadian pulp. Hitherto the price of this pulp has been high in comparison with that supplied from Europe, and it has therefore, not been imported as largely as the European product.

As a result of the war, however, the demand has gradually increased and at present the monthly amount imported is said to average 400 to 500 tons.

Recent prices for Canadian pulp were quoted at 5 sen per pound for the first class, 4-8 for the second class, and 4.4 for the third class with the probability that they will presently see an advance.

A NEW USE FOR PAPER.

In northern France squadrons of a Hanoverian dragoon regiment were posted in the neighborhood of a paper mill. The bales of paper on hand were found to be admirably adapted for entrenching purposes, and a strong supporting point was at once established with steps and loopholes armed with machine guns and artillery.

Senses of Trees

Mr. James Rodway, who is the curator of the British Guiana Museum, and an eminent botanist, declares that plants have at least three of our five senses—feeling, taste and smell—and that certain tropical trees smell water at a distance, and will move straight toward it.

But trees not in the tropics can do as well. A resident of an old Scotch mansion, says a writer in the Scotsman, found the waste pipe from the house repeatedly choked. Lifting the slabs in the basement paving he discovered that the pipe was completely covered by poplar roots. They belonged to a tree that grew some thirty yards away on the opposite side of the house.

Thus the roots had moved steadily toward the house and had penetrated below foundation and across the basement until they reached their goal, the waste pipe 150 feet away. They they had pierced a cement joining and had worked their way in. There seems something almost human in such instinct, and perseverance in surmounting obstacles.

B. C. FOREST FIRES.

Aproximate figures compiled in the Vancouver timber office show that the extent of the bush fires in the Vancouver district this year was the worst in thirty years. When it is known that 236 reported fires burned over an area of 113,254 acres during this summer, some idea of the extent of the problem confronting the forest department during August and September will be given. In 1914 the number of fires was 140 and the acreage 21,550, while in 1913 there were only 42 fires and only 120 acres burned over.

The number of fires given above does not include the small fires put out by one or two men without calling assistance from the Vancouver office.

TOWN PLANNING.

Thomas S. Adams, of the Commission of Conservation, and a prominent city planning devotee, has suggested, in a letter sent to Controller Thomas S. Morris, of Ottawa, that a city planning league be formed in Canada, and that a convention of city officials and legislators be held in Ottawa with this object in view. Controller Morris stated that there would be a meeting shortly of the local city planning commission, as there were three important matters to be considered. They are the drafting of a provincial act on city planning similar to that passed in Nova Scotia; directing the city engineer's department to prepare an inventory plan of the city for the commission to work on; and, the matter of manufacturing sites and railway siding accommodation and the filling in of low lying lands.

NEWS PAPER.

There are newspapers with good circulations in Georgetown, Port-of-Spain, Bridgetown, Barbados and Kingston, Jamaica. Canadian manufacturers of news print paper should note that the newspaper men of these colonies attach special importance to the colour of the paper. They like a white paper.—Canadian Trade Report.

A Chance for Canadians

The United States Civil Service Commission announces an open competition examination for pulp and paper engineer, for men only. From the register of eligibles resulting from this examination certification will be made to fill a vacancy in this position in the Forest Products Laboratory, Forest Service, Madison, Wis., at a salary of $3,500 a year, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The duties of this position will be to direct the work of the section of the Forest Service which conducts pulp and paper investigations. Applicants should be thoroughly familiar with the methods and processes employed in the manufacture of wood pulps and of the paper made therefrom as commonly practiced, with the technical problems confronting the pulp and paper industry, and should have had experience in conducting and directing investigative work.

THE ASH TREE IN CANADA.

White ash lumber is produced in Canada, south of a line extending from Gaspe, Quebec, to Sault Ste. Marie, Ontario. It is the most valuable of the ash species and forms the greatest part of the production. Black ash lumber is usually considered less valuable than white, except for decorative work. The lumber is cut in Canada from Anticosti Island to Lake Winnipeg. The tree is a swamp species, and does not usually produce lumber of as large dimensions as white ash. Red ash is cut only occasinoally in southern Ontario. Green ash, a variety of red ash (var. lanceolata) is found in southern Ontario and southern Manitoba and Saskatchewan, but is not a lumber-producing tree.

PULP FROM BEAN STRAW.

The farmers of Venture County, Cal., have incorporated the Pacific Fibre & Retarder Co., with headquarters at San Buenaventura, which has control of some process or processes by means of which it is proposed to manufacture fibre, yarns, rope, twine, bags, paper, paper pulp fertilizer and other like products from the piles of bean straws that annually go to waste in the greatest bean fields of the West. The company is incorporated at $500,000, of which amount but $726 has been subscribed.—The Paper Dealer.

JAPANESE PAPER TRADE.

Paper millers are confronted with a difficulty very hard to combat and not to be relieved in the near future. The Germans and Austrians who have the supply of raw cotton from America stopped have sought a substitute in paper pulp produced in Scandinavia in large quantities, with the result that not only have prices of paper pulp been appreciated very much but the supply of the goods to the East has been checked.

WRAPPING PAPER AND PAPER BAGS.

Large quantities of wrapping paper and paper bags are required in the West Indies. Canada should be able to supply a considerable proportion of the demand. A cheap straw wrapping paper is imported from Scandinavian countries.—Canadian Trade Report.

Tank Cars for Fire Fighting

The management of the Government railways has made material progress in fire protection in Quebec since taking over the line of the National Transcontinental for operation. A tank car, for fire-fighting purposes, has been equipped and will be stationed at some covenient point betewen Edmundston and Quebec. This car has a capactiy of ten thousand gallons, and is equipped with hose to reach a fire five hundred feet from the track. The question of placing two similar cars at convenient points between the City of Quebec and the Ontario boundary is under consideration. Special fire patrols will also be necessary, and the details are being considered.

FINNISH PULP INDUSTRY AFFECTED.

The wood-pulp industry and other manufacturing pursuits of Finland are seriously affected by the war and the stoppage of exports to Germany, according to Welin Palcheimo, a civil engineer of Helsingfors, who has arrived in America on the steamer Kristiansiford from a Norwegian port.

Man yfactories have closed their doors, he said, and as a result other occupations are crowded, and Finland is facing the winter with anything but bright prospects.

RIORDONS NOT BUILDING NEW MILL.

"There is no truth in the report that the Riordon Pulp and Paper Company are about to build a news mill in Northern Ontario," declared an official of the company to the Pulp and Paper Magazine. "We purchased the Foster mill at Haileybury, and are using it as a rossing mill. We take the pulp wood from Lake Temiskaming, have it rossed, and then ship it to our Merriton mill, and that is all. Business is not good enough at present to encourage us to build a new mill."

OLDEST PAPER IN FRANCE SUSPENDS.

The oldest newspaper in France, the Gazette de France, has suspended publication after appearing for nearly 300 years. The publishers hope to revive the paper after the war. It was founded in 1631 by Theophraste Renaudot.

LUMBER FOR THE ALLIES.

Approximately 50,000,000 feet of rough yellow pine lumber has been sold to the British Allies by mills in Kansas, according to reports in the trade. The huge business is reflected in advances of as much as $2 in the price of that lumber.

The European armies, it is said, found that the metal houses they used last year were uncomfortable partly because the steel proved a good conductor of cold. Besides, the metal for such houses is scarcer and higher now, hence the demand for the rough yellow pine boards.

PAPER MILL BURNED.

The paper mill of the MacLeod Pulp and Paper Company, Limited, situated at Milton, near Liverpool, N.S., and valued at about $250,000, was totally destroyed by fire on November 1st.

New Fibres for Paper Making

(U. S. Consular Report.)

The success that attended the experiments undertaken some time ago by the Argentine Bureau of Forestry to produce a commercial pulp from the pines (Araucaria imbracata) of Neuquen territory directed attention to other pine-bearing areas of the Republic, and announcement has just been made of the successful conclusion of similar experiments with cellulose from Misiones.

The Misiones pines, although possessing characteristics different from those of the trees of Neuquen, show practically identical results. The fibre of the former is longer, but, on the other hand, that of the Neuquen pine is more resistant, and in both cases one-half ton of pulp can be obtained from a ton of the wood. Another basic difference offered by the pine of Misiones is that it has its resin between the wood and the bark, thus obviating the necessity of extracting that product.

The experiments with Misiones trees were not made with white pine, but with a specimen whose wood had a reddish color, due to soil influences. In spite of this, the fibre when treated with bisulphite gave a pulp surpassing in whiteness that of the paper materials which are imported from Europe.

Will Prove a New Source of Wealth.

In commenting on the outcome of the Bureau of Forestry's work the local newspapers said:

It is needless to dwell upon the importance of these experiments and the opportunity they offer for the promotion of an industry which, in a more or less short period, is capable of becoming a constant source of riches. If, as the results of the experiments made up to now allow it to be hoped, the pulp obtained from the pine trees of Neuquen and Misiones is a good article commercially, the enormous supplies of these forests will permit the satisfying of the national needs and the exportation of the remainder. Moreover, the stands of pine in Misiones are largely on public lands, so that the Government would be the first beneficiary from their industrial utilization.

Prior to the war in Europe—that is to say, in the year 1913—there were imported into Argentina more than 70,500,000 pounds of wood pulp, 8,289,400 pounds of which came from Germany, 19,290,500 pounds from Norway, 38,801,400 pounds from Sweden, 1,964,300 pounds from the United States, 910,500 pounds from Denmark, 846,500 pounds from Holland, 343,900 pounds from Switzerland, and 264,500 pounds from Austria.

(The Indian (Government) Trade Journal, Aug. 13.)

Indian Weed Yields a Good Fibre.

Whether Hedychium coronarium will ever be used to an large extent in other countries is problematical, but it seems worth while for Indian paper makers to give it their attention.' This plant of the ginger family is distributed from the Himalayas to Ceylon and Malakka, ascending to 4,000 feet in the Khasia Hills and 6,000 feet in Ceylon. It is also native in Central was introduced into Brazil, where it has been wild in many of the States. In India the plant appears to thrive best in swampy tracts, but here also it runs wild.

As a paper-making material it seems to have first America, the West Indies, New Zealand, Mauritius, and West Africa (Corsico Bay). Many years ago it been put forward by Brazil, but those who have experimented with it are disposed to think that Hedleychium coronarium will yield good paper-making qualities from whatever part of the world it is gathered, and that any differences in the pulp from Calcutta as compared with that from Brazil are to be attributed to the method of preparing the raw fibre prior to shipment rather than to any variation in the growth of the plant itself. The pulp it yields is easy to manipulate and is capable of producing a paper of exceptional strength.

A Valuable Swamp Crop.

In India bedychium is a common wild plant in swamps and wet places, and on the edges of paddy fields. It is easily propagated. In one of the plantation districts in the south the estates are very much broken up with valleys and nullahs, the latter carrying off monsoon water, and consequently there are many swamps which cannot be put under either tea or coffee. These are a source of trouble to the planter, since they grow weeds that seed into cultivated areas, and are apt also to be reserves of scales, grasshoppers, and various harmful insects, which escape to the coffee and tea.

It was suggested some years ago that such swamps might be planted with a plant that could be kept under control and cut and used as a mulch. The suggestio was adopted. In at least one instance hedychium was the plant selected as a useful, clean weed. It was a great success. It grew quickly, exterminating all other weeds and shrubs; and each year it is cut at regular intervals and used as a mulch for the growers' staple products. The same plan is now being carried out on other areas, and there is no doubt that the supplies of the plant could be increased very largely.

It has been grown also in British Guiana, and a recent report states that the first planting produced 28 tons of stalk and leaves per acre as a five months' crop on dry land. On irrigated land the first trial failed.

(Consul Talbot J. Albert, Brunswick, Germany, Sept. 20.)

Successful German Experiments with Hop Vines.

Announcement has been made of the results of experiments undertaken by the Institute of Chemical Technology at Brunswick looking toward the discovery of new and cheaper methods of manufacturing paper from vegetable fibres. Willow-tree bark and broom fibre did not give satisfactory results. Experiments were then made with the fibre of hop vines, of which there is a plentiful supply in Germany.

It was found that when the fibres are treated with lye their separation is difficult. They are more easily separated by soaking in a 0.5 per cent solution of an inorganic acid. The same result can be obtained by a steam pressure of half an atmosphere. Separation of the fibre is easier when working with old hop vines that have stored for a long time in the open air. It follows that storage in the open air or, better still, artificial storage in a warm, moist storehouse, is the

best method of furthering separation. In this way a return of 20 per cent of good fibres was obtained.

The remaining wood, when treated with soda lye under a pressure of 3 atmospheres, produced an excellent paper pulp, and the roots of the vines yield an especially long fibre.

THE POSSENTRY TREE AND THE PAPER INDUSTRY.

The Paper Trade Journal states that a company has been established for the export of possentry wood at Paramaribo (Dutch West Indies), with the object of preparing the wood in such a way as to fit it for the manufacture of paper. Experts on wood pulp have stated that the pulp made out of possentry wood is a valuable prime material for the manufacture of paper. Mr. R. W. Sindall, of London, has brought out a report in which the possentry wood pulp is praised. On account of the experiments made by Mr. Sindall, the paper manufactory at West Hartlepool has made paper out of this pulp. Thereupon Mr. J. Nassy, of Paramaribo, made a trip to New York, accompanied by Dr. W. H. Bradley, and introduced the possentry pulp to several large paper manufactories, meeting with the general approval. A part of the shares has been placed already in Holland and the West Indies, while a representative of the company will take the necessary steps to place the rest of the shares in the United States, expecting to interest American financial men in this new Surinam enterprise.

FIRES ALONG HUDSON BAY RAILWAY.

Large areas of forest have been destroyed this year by fires, which have occurred along the Hudson Bay Railway, under construction for the Dominion Government, between Le Pas and Port Nelson, Manitoba, according to a statement recently issued by the Conservation Commission. It is estimated that the burned area will total not less than 500,000 acres, causing a destruction of forest values amounting to $250,000, in addition to a heavy loss of game and fur-bearing animals. In some cases considerable quantities of supplies belonging to railway contractors were also destroyed.

PROTECTING THE FORESTS.

The fining of Quebec settlers for causing damage to the standing forests goes on with great vigor. No less than nineteen additional convictions were recently scored at Nominingue, P.Q., by his Honor, Judge Goyette. Prosecutions were conducted by the Quebec Government on evidence furnished by the officers of the Lower Ottawa Forest Protective Association. The forest laws of Quebec require all settlers to secure a permit from a fire ranger before starting fires in their clearings. The object of the law is to give common protection and treatment to all settlers, as well as to guard the great standing forests from permanent injury. Most of the settlers are glad to support the rangers in their work, but in some districts criminal negligence and defiance of the law have made prosecution necessary.

LUMBER YARD FIRE.

Fire broke out in the lumber yard of the Jewell Lumber Company at Hanbury, B.C., and destroyed practically all the dry lumber in stock.

FOREST NURSERIES.

The State of New York has planted on State lands, up to the end of 1914, over four and a half of 1,200 trees per acre, to reforest nearly 3,800 acres of land. From the State nurseries there have been sold to private landowners, for reforestation purposes, over thirteen million trees, while more than two and a quarter million have been furnished free of charge to State institutions.

In Canada, similar work, though on a somewhat smaller scale, is being done by the provincial nurseries at St. Wiliams, Ont., and Berthierville, Quebec. Similarly, the Dominion Forestry Branch has a large nursery at Indian Head, Sask., and another is in process of preparation at Sutherland, Sask., from which nursery stock will be available during 1916. The number of trees shipped from the Indian Head nursery has steadily increased from over two and a half millions in 1910 to about three and three-quarter millions in 1914. These trees are distributed among farmers throughout the prairie provinces, mainly for shelterbelts, woodlots and the beautification of grounds around buildings.

THE FUTURE OF THE GERMAN CHEMICAL INDUSTRY.

German chemical experts appear to be getting uneasy as to the future of the German chemical industry in view of the efforts which the Allies and neutral countries are making to build up an industry in fine chemicals. "England's Chemical Industry and the War," was the title of a lecture delivered by Professor Dr. H. Grossmann at a meeting of the "Verein zur Beforderung des Gewerbefleisses" in Berlin recently, and the Zeitschrift fur angewandte Chemie quotes the following extract from it: "German chemical industry will have to take account of the chemical industry in England and in the United States on the conclusion of peace. These countries will do everything possible to ensure success in technical and economical affairs. At any rate, it would be very imprudent to rely beforehand upon a failure of these endeavors, therefore it is of the highest importance to follow with attention the development of chemical industry in these and other countries for at present as well as in 1893, the words of the North American Review are true: "The country that disposes of the best chemists will be the richest and the most powerful eventually. It will possess the best foodstuffs, the best products at the lowest prices; it will have the best weapons, and the loss of material in the manufacture will be reduced to the smallest proportions possible.'"

HEAT VALUE OF FOODS.

Certain kinds of wood -hickory, oak, beech, birch, hard maple, ash, elm, locust, long leaf pine and cherry —have fairly high heat values and only one cord of seasoned wood of these species is required to equal a ton of good coal. Hickory of the non-resinous woods has the highest fuel value per unit volume of wood and has other advantages. It burns evenly, and, as housewives say, holds the heat. The oaks come next, followed by beech, birch and maple. Coastwise vessels in Florida pay twice as much for Florida buttonwood as for any other, because it burns with an even heat and with a minimum amount of smoke and ash.

UNITED STATES NOTES

An action taken by a city in Michigan is being watched by the paper industry with considerable interest. A few days ago the health officer of Adrian, discovered that many cases of typhoid in that city had been caused by the use of glass milk bottles. The milk peddler, it was discovered, had used the bottles without washing. The health officer immediately issued an order forbidding the use of glass milk bottles, and making it mandatory that every milk dealer in the city distribute his milk to his patrons in paper milk bottles. He also ordered that a paper bottle could be used but once.

* * *

Isaac Leopold Rice, president and treasurer of the Casein Manufacturing Company, 11 Pine street, New York, died on November 2 in his apartments at the Hotel Ansonia. Mr. Rice was sixty-five years old. He was known as a financier, lecturer, promoter, inventor and philanthropist. He was one of the organizers of the Casein Company of America, and was its first president.

* * *

Paper manufacturers of Wisconsin are interested in the supply of water used by their employes for drinking purposes, as the Supreme Court of the State has declared that typhoid fever, when contracted by an employe as the result of polluted water provided him while in pursuit of his work, is construed under the Workmen's Compensation Act as an accident. This is the first time in the history of compensation legislation that a disease of this nature has been classified as an accident, and is considered a veritable revelation.

* * *

Machinery for the new Rex Paper Company's mill has began to arrive in Kalamazoo, Mich. Several washers, of the King-Neary variety, made in Appleton, Wis., have reached the city. It is expected that the boilers from the Wicks Company at Saginaw will reach there during the early part of next week. The new stack has been completed, being built entirely of concrete. George E. Higgins has also secured the contract for the installation of the sprinkler system, which will cost about $10,000. Work on the mill is progressing nicely, and contractors are sure to have it completed before next June.

* * *

F. M. Hodge, President of the Kalamazoo Paper Company, Kalamazoo, Mich., has been selected as one of the few to direct the campaign of Kalamazoo College for a $100,000 endowment fund. Mr. Hodge is a member of the college board, and he has always taken an active interest in behalf of this educational institution. His selection as chairman of the most important committee in the endowment campaign was not a surprise to those who know his interest in the college.

* * *

The Van Sant-Houghton Company a San Francisco contracting firm, has been awarded the contract for erecting a reinforced concrete building at Canas, Wash., for the Crown Williamette Paper Company. The structure is to be used as a digester house in connection with the Company's paper plant. It will be three stories high, 55 x 67 feet in dimensions and will cost about $30,000.

* * *

The pulp mill of the Bear River Company at Petoskey, Mich., has resumed operations this week, having installed a hydraulic press and pump for use in the preparation of its bleached sulphite pulp for shipment. Under the new operation the entire output of bleached sulphite will be sold to mills that use this furnish, but which do not produce it themselves. The November output has already been sold and a proportion of the annual production has been contracted for. The mill will do its own selling.

* * *

For several days during the early part of the month a fire raged in the timber tract near Felts Mills, Watertown, N. Y. owned by the Taggarts Paper Company. The amount of damage done has not been estimated. A tract more than a quarter of a mile in length has been wiped out, and it is said that the fire consumed one of the best sections of the timber which was nearly ready for use at the paper mill. None had been taken from the tract in several years.

* * *

British Columbian paper and pulp mills are to adopt the safety first methods in mills of Wisconsin. A special investigation committee has just left Wisconsin after a very painstaking tour with it all of the ideas into practice in Wisconsin paper and pulp mills, and will impart its information to the manufacturers in Canada. The Wisconsin system pleased the sage a bill embodying practically all of the features of the Wisconsin workmen's compensation law.

* * *

The new plant of the Union Bag and Paper Company, at Thirty-ninth and Ashland Avenues, Chicago, Ill., is being rapidly pushed forward, and work is being rushed to enable the company to begin operations there as speedily as possible. Manager Nelson is in the city attending to necessary details in regard to the building, installation of machinery, etc.

SEND FOR CARNEGIE.

The consumption of paper is shown in that there are over 18,000 regularly established libraries in the United States, containing more than 75,000,000 volumes, according to statistics just compiled by the United States Bureau of Education. The number of volumes is an increase of 20,000,000 since 1908.

Of the 2,849 libraries containing 5,000 volumes or over, 1,844 are classified as "public and society libraries," and 1,005 are school and college libraries. Public and society libraries have an aggregate of over fifty million volumes, with seven milion borrowers' cards in force; 1,446 of these libraries were entirely free to the public.

PULP AND PAPER NEWS

E. Pullan, dealer in paper stock, Toronto, has opened a branch business in Hamilton, at 90 Locke street south, which is in charge of his son, Harry Pullan, who has taken up his residence in that city. Mr. Pullan reports that the market is improving in rags and paper stock and that more inquiries are being received than for some months back. There has been a slight raise in prices generally.

The Toronto office and warehouse of the National Paper Co., of Valleyfield, Que., have been removed from 15 John street to 7 Bay street, where larger premises have been acquired. E. G. R. Clarke is the Toronto representative of the company, and he reports that business has considerably brightened up in the coated paper line during the past few weeks.

The machine room of the Provincial Paper Mills Co. at Mille Roches, Ont., has been covered with a new steel truss roof. The plant was closed down for a few days while the work was going on, but is now in full operation.

The plant of the Dryden Timber and Power Co., at Dryden, Ont., which has a capacity of forty-five tons a day for kraft pulp, is rushed with business. Certain additions are being made which will be completed by the end of the present month, and will increase production by about fifteen tons a day. J. B. Beverdige, who is the general manager of the company, says that the outlook for the coming winter appears exceedingly favorable and profitable for kraft pulp, which, from present indications, is expected to go four or five dollars higher than the figure now prevailing.

Lovells, Limited, Toronto, with a capital stock of $100,000, has been granted a charter to carry on the business of stationers, printers, envelope manufacturers, book binders, box makers, card board manufacturers, etc.

Fordell Calendar Co., Limited, Toronto, has been incorporated with a capital stock of $40,000 to carry on engraving, lithographing, printing, etc., and to manufacture and deal in colors, inks and papers, etc.

A federal charter has been granted to Business Systems, Limited, with a share capital of $500,000, and chief place of business in Toronto. Ernest J. Grigg is one of the chief incorporators. The company has power to manufacture, buy, sell and deal in all kinds of stationery, office supplies, account books, loose leaf system of accounting and to carry on a general business and publishing business.

An action was recently entered by a gramophone firm against the Fullerton Publishing Co., Toronto, who issue the Canadian Music Trades Journal, for $10,000 damages. The plaintiffs claimed that an article entitled "Kaiserism in the Talking Machine," tended to injure their standing by inferring that they were doing business in an underhand manner in making an agreement with their customers to handle their goods exclusively for five years. The jury brought in a verdict for $1,500 against the publishers.

Recently several paper men have been enjoying hunting trips. I. H. Weldon, president of the Canadian Pulp and Paper Association, and George Ball, selling representative of the Montreal Box Board Co., have returned to Toronto after a successful outing in the French River district. Alex. Buntin, of Buntin, Reid Co., and Albert Brown, of Brown Bros., Toronto, were among recent visitors to that section. John G. Sutherland, sales manager for the Spanish River Co., and a party of friends enjoyed a fruitful moose hunt at Nashkodi, on the line of the Central Algoma railway.

E. S. Williamson, secretary of the Lands and Forests Department of the Ontario Government, passed away in Toronto last week. He was a member of the department for sixteen years, was foryt-three years old, and is survived by his wife and two daughters. Tuberculosis was the cause of death. Mr. Williamson was not only an authority on the timber wealth of the province, but a great lover of Dickens, the noted novelist. He lectured on and impersonated Dickens' characters, and founded and organized the Dickens Fellowship in Toronto, which, with its one thousand members, has become the largest in the world.

The Riordon Pulp and Paper Co. have bought the old Foster mill in Haileybury, Ont., and will improve it so that it will be able to handle several million cords of pulp wood. It is reported that this purchase is a preliminary to the establishment of a large sulphite plant in Northern Ontario, which the firm have had in contemplation for some time.

Recently there has been some activity on the Toronto stock exchange in the common stock of the F. N. Burt Co. and the Pacific-Burt Co., the former paying a dividend of four per cent on the common and the latter of two per cent. Both companies are doing well and have a large number of orders on hand, the Pacific-Burt Co. having the best year in its history.

W. P. Ryrie, Toronto, who is managing director of Becker & Co., of America, is able to be around again, after being ill for some time.

ONTARIO'S REVENUE FROM FORESTS.

Ontario's revenue from lands, forests and mines will this year reach, if not exceed, the sum estimated—$2,000,000. Last year the receipts from these sources, on account of the disorganization created by the war, fell short of what had been anticipated before hostilities broke out. This year's estimate seems to have been based pretty much on what was received last year. According to Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines, there has been an appreciable improvement so far as the lumbering is concerned, the American market, which was to some extent panicky twelve months ago by reason of the war, having proved better.

The Markets

CANADIAN MARKETS

There is a good demand for news print just now, and all the plants are busy. Some of the mills are reported to be oversold. There has been no change in prices, but, if the outlook measures up to what is expected, there may be a stiffening in quotations by the end of the year. Several inquiries are being received from Greece and other countries. In all lines of trade recently business has been picking up somewhat, and the paper industry is feeling the uplift.

Book and writing plants are well employed, and report that orders are considerably more numerous than they were some weeks ago, although few of the plants are running to their fullest capacity. Coating paper mills are getting busier as the holiday season approaches, while the market for kraft is strengthening all the time. Leading jobbers are well satised with the turnover for the past month, and expect to be busy until Christmas time.

In the pulp line the sulphite situation is becoming acute and more inquiries are being received. Stocks on the docks are very low and very little is arriving. The Scandinavian mills cannot get vessels for transportation, and can sell their pulp in European countries at a much higher figure than they receive in America. German mills are reported to be paying fabulous prices for sulphite, and in England the figure is much higher than it is in America. A leading importer remarked this week that he had over two thousand tons on the docks at New York, most of which he had disposed of lately at an advance of five dollars. One Canadian firm is getting from three to four dollars more a ton than was secured three months ago. Manufacturers, in view of the possible scarcity, do not care to enter into long term contracts, and will not covenant for more than fifty to sixty per cent of their production under present conditions. One enthusiastic sales manager predicts that the figure for easy bleaching sulphite, delivered, may reach $50 per ton by the end of the year. Bleached sulphite has also taken a jump, while kraft pulp is in strong demand, and may go from three to four dollars higher than present prices. This is occasioned by the fact that a very marked stir has taken place within the last few weeks. One Canadian company is increasing its output by at least one third, and has all the business that it can take care of under present conditions. The ground wood market is without change. It has been dull for some months owing to the excellent water conditions prevailing on the other side of the line enabling mills, which enter the market at low water time, to grind their own supplies.

Some new varieties of paper are being placed on the Canadian market in the shape of manifolding paper, onion skin, etc., made by local plants. It is felt that there will be a good sale for these specialties. Toilet and tissue paper mills are busy, and prices are strengthening. The color situation is daily becoming more acute, and most of the manufacturers are very conservative on this line of business, while prices are constantly ascending. Building papers, which have been inactive all summer, are moving more freely. In the rag and paper stock line things are improving. There are more requisitions and a considerable jump has taken place in roofing stock. The prospects generally are good.

Business in the pulp and paper line has brightened up considerably of late, and the future is one that will be watched with interest.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.90 to $1.95 at mill, in carload lots.
News (sheets), $1.95 to $2.10 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $4.00 to $5.00.
Glazed Kraft, $4.25 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite ((unbleached), $42 to $45, del. in Canada.
Sulphite (unbleached), $44 to $46, delivered in U.S.
Sulphite (bleached), $58 to $62.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, 85c.
No. 2 book stock, 40c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.05.
No. 1 print Manilas, 75c.
Folded News, 42½c.
Over issues, 45c.
No. 1 cleaned mixed paper, 32½c.
Old white cotton, $2.00.
No. 1 white shirt cuttings, $5.25.
Black overall cuttings, $1.50.
Thirds, blues, $1.50.
Black linings, $1.50.
New light flannelettes, $3.75.
Ordinary satinets, $1.50.
Flock, $1.60.
Tailor rags, $1.40.

Blue overall cuttings, $3.75.
Manila rope, 2½.
No. 1 burlap bagging, $1.35.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45. to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKETS

Special to Pulp and Paper Magazine.

New York, Nov. 12, 1915.

Little activity is being manifested in the markets for ground wood pulp. Most of the new mills are pretty well supplied with stock. Water conditions continue favorable and the paper manufacturers who have grinding machines have been able to keep them in constant operation. A large inquiry for export has stimulated the market a little. Many of the European countries are in need of mechanical pulp and there are, at present, numerous opportunities for business. There is, however, a lack of shipping facilities which makes it practically impossible to fill all of the orders which are being received. The prospects for a brisk demand from the domestic consumers are rather slim, for they have, it is reported, been able to put aside large stores for future use.

The chemical pulp market is reaching a stage which is possibly more serious than any which has as yet been known in the history of the trade. Paper manufacturers who have been unwilling to pay the prices which were asked a few months ago, are now awaking to the true state of affairs and are making more liberal offers. But, this seems to be in vain. Prices have been advancing rapidly and always seem to be a little ahead of the offers of the consumers. Attempts to make contracts have been futile, to a great extent. Advices from abroad are not very encouraging for the future supplies of pulp. The Scandinavian mills have been operating at about 50 per cent capacity. From this production, they have had to meet a demand which came from practically all over the world. Not alone this, but the pulp makers have been working against all kinds of handicaps which have been tending to make The difficulties in securing coal still remain unsurmounted. England's total embargo makes it necessary to seek supplies of coal in the United States. Shipping facilities here, however, have been and still are so poor that it is useless to attempt to export enough to meet the demands of the pulp producers. The prices on this commodity have advanced from three to four times its original cost. Rosin and sulphur must both be shipped from the United States and, with each, the same problem of transportation confronts the pulp mill. Prices, too, are greatly increased. The question of bleached pulp is, to all appearances, the most serious of them all for it seems almost impossible to get any further supplies of bleaching powder. The market for bleaching powder has been completely sold out for the current year. This material was formerly obtained in large quantities from England. Now that Great Britain is using its bleaching powder in the making of explosives, the demand has diverted to America. The demand here, however, has been very great and the supplies have been hardly sufficient to meet domestic needs. So it can readily be seen how the market was affected by the inquiry from abroad. Bleaching powder, which sold normally at about 1 ¼c a pound is almost unobtainable now at 5c a pound. The consequence has been that some of the bleaching mills have ceased making this particular grade of pulp, while others have curtailed their production. Easy bleaching has sprung into popularity on account of the situation in the bleached pulp market. Easy bleaching is now being quoted at as high as $2.85 and even at this figure only limited supplies can be obtained. Strong unbleached is also in demand and hard to obtain. Kraft pulps are very scarce and hard to get. Prices on this stock are advancing rapidly. It is somewhat of a question what the manufacturers of kraft papers will do for their raw materials for it does not seem that we will be in a position to get much pulp for some time. Domestic manufacturers do not offer much encouragement to the paper maker. They report the larger part of their production sold ahead for this year and for the bigger part of next year. Conditions seem to be shaping for a famine in pulp.

The rag market is stronger and firmer than it has been in years and grows more active from week to week, constantly headed upward. There is a general scarcity in rags which is being felt very much now because the consumers are in need of stock and are searching the open market for supplies. The remark-

able demand for roofing is undoubtedly the cause for the way in which this market is hold up. The roofing mills are very busy at present, not only with home business but taking care of greatly increased business from abroad. It is this export trade which is reckoned on to tide the roofing paper manufacturers over the dull season, generally experienced in December and January, and to thus keep the firm conditions in the market prevailing. At present, it has been necessary to use quantities of thirds and blues and soiled white because of the shortage of stock for roofing. Of course, when the writing paper men come into the market for their rags, there will be just so much less stock available. Prices on all grades are going up tremendously. Foreign rags are acting in direct sympathy and are in good demand. Imports are small and the prospects for future supplies are very poor. Bagging is firm and very active. Here, as in the rag market, there is an acute shortage of stock and consumers find it possible to get only limited supplies. Gunny bagging is being quoted at 2c. Bright bagging is quoted at 1.75c; sound bagging, at 1.50c; mixed bagging, at 1.30c. Manila rope is brisk and hard to get at 2.90 to 3.25c. Waste papers are in fair demand and prices are satisfactory. Shavings have shown considerable improvement and so have book, manila and kraft stocks. Owing to the activities of the board mills, mixed news is showing to better advantage.

Conditions in the paper market are splendid and seem to be improving all of the time. Manufacturers of practically all kinds of papers are increasing their capacities for operation and report lots of orders on hand. The feeling about the city is decidedly optimistic. Jobbers are doing well and are ordering in larger quantities than they have been doing for some time. The mills are now confronted with the question of making deliveries. There seems to be no doubt but that prices on all papers are preparing for an advance. The costs of raw materials are increasing so very much that it will be simply impossible for the manufacturer to continue his business unless he gets more money for his products. Some grades of paper have already gone up. Colors are still a disturbing factor. Recent investigations have shown that it is useless to expect new supplies of deep colors before two years have elapsed. Newsprint is feeling the effects of the sulphite situation and is holding very firm. There is, however, a good demand for stock, and mills all over the country are running at about from 95 to 100 per cent. Of course, it is not known just what the plants in the Black River district are doing, on account of the strike, but it is believed that they are producing far from their ordinary output. It is this which is believed to have helped the distribution of the demand considerably. It is not likely that newsprint will go much higher, but it will most probably stay at its present level for some time. The season is now approaching when most of the contracts for the year are made. Tissues are decidedly much firmer. There has been a general advance on these goods, and it is impossible now to buy at prices lower than the new prices. However, little new business has been consumated during the past week or so because the mills are filled with orders at the old prices and are running to capacity to take care of these. Jobbers are hesitating and are waiting to see just what "the next move will be." The good white tissues are now being quoted at 42½ to 45c, while the manila tissues are being offered at 40 to 42½c. Some of the mills have withdrawn all quotations and are just quoting on immediate business. Manila wrappings are in good demand and are bringing higher prices. Most of the mills making these papers are running with orders enough on hand to keep them through December. Fibres are more active and have already advanced a little. Bogus papers are brisk and higher. Kraft papers are doing very well. They feel the conditions in the kraft pulp market strongly and have advanced in price. It is most likely that further advances will be witnessed in this market soon. Boards are selling at better prices and are in good demand. Reports from the board mills all over the country show that they are all operating at full capacity.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 2.25 to 2.35c., delivered.
Bleached Sulphite, domestic, 2.95 to 3.15c., delivered.
Bleached Sulphite, impt., 3.50 to 4.00c, ex-dock, N.Y.
Easy Bleaching, impt., 2.40 to 2.85c ex-dock, N.Y.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $24 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $22 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

Unbleached Sulphate, impt., 1.85c to 2.05c., ex-dock, N.Y.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 215 to 225c

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.

TEXAS APPOINTS FORESTER.

Texas has oined the ranks of states which are taking a progressive attitude with regard to forestry. A state forester has recently been appointed, whose work will combine administative teaching and investigatory features. Texas is one of the great forest states of the Union, and her definite adoption of the forestry principles will mean much in bringing about better methods for the protection and perpetuation of this great industry.

Pulp and Paper Notes

A substitute for absorbent cotton is made in Germany from pure pine cellulose.

Much timber in New Zealand having been found highly suitable for the manufacture of wood pulp, the government is fostering the establishing of the industry.

A German scientist has demonstrated that radium has a marked effect on woody plants, even forcing them to bud in dormant seasons.

A new wood suitable for lead pencils has been found in East Africa at a time when the supply of American cedar, largely used for the purpose, is approaching exhaustion.

A firm of commission merchants in Barcelona, Spain, desires to correspond with Canadian manufacturers of pulp for manufacturing paper. Good references offered.

"The question of the protection of our forests from fire is first of all a question of morals; to burn useful material without any reason for burning is immoral." —Dr. Fernow.

Mr. J. R. Booth, Jr., is in Ithaca, N.Y., where he is taking a three months' course at the Thomas Aviation school, prior to leaving for England to join the aviation corps.

The Mattagami Pulp and Paper Co. will commence at once the erection of pulp and paper mills at Smooth Rock Falls, on the Mattagami River, to cost $2,000,000.

THE VALUE OF BIRDS IN FORESTS.

Birds attain their greatest usefulness in the forests, because the conditions there closely approach the primeval.

Forest trees have their natural insect foes, to which they give food and shelter, and these insects in turn have their natural enemies among the birds, to which the tree also gives food and shelter. Hence it follows that the existence of each one of these forms of life is dependent upon the existence of the others. But for the trees the insects would perish, and but for the birds these trees would perish; and, to follow the inexorable laws of nature to the conclusion of their awful vengeance, but for the trees the world would perish. —The Value of Birds to Man, by James Buckland.

PAPER BOX FACTORY BURNS.

Twelve girls and two men, employed in the factory of the Union Paper Box Company of Pittsburg, are known to be dead, eight girls are badly injured, and a number of others are missing, as the result of a fire, which started in a nearby feed store, and spread to the factory.

A NEW BREAKFAST FOOD.

German scientists have been renewing experiments initiated nearly 100 years ago and announce that they are able to turn ordinary wood into a nourishing substitute for flour. Birch is wood most advantageous for this purpose.

Berlin Coard of Trade Praises Commission

At a recent meeting of the Berlin Board of Trade, the following resolution was passed in regard to our fire losses: The Canadian Commisison of Conservation has achieved excellent results in the conversation of our national waterpowers in the great reduction of forest fires along our railways, has initiated a movement for conservation on broad national lines for city planning, and has sought out and applied means to conserve our national resources in other directions, thus making it indispensable that they have the organization to take up this most important and directly beneficial feature of national conservation with every prospect of success.

The Berlin Board of Trade requested the Canadian Commission of Conservation to take up this matter as a special department of its work with expert assistance for formulating recommendations to the different provinces, and directing an effort in Canada to approximate gradually to the European standard; and concerted action in a movement of this kind is more likely to bring results.

THE SAPODILLA TREE.

"The sap of the sapodilla tree is very largely used in the manufacture of chewing gum. The tree is cultivated in Mexico and Central America, and the method of collecting the sap, called "Chicle," is very similar to that employed in extracting maple sugar. Mexico alone in 1910 exported chicle valued at £340,000, which will give a good idea of the extent of the chewing gum industry."

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

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The Scientific Attitude

There is no call for the use of superlative terms of the ordinary type in anything we may say about the Fall meeting of the Technical Section of the Canadian Pulp and Paper Association. The conference was a thoroughgoing success, and all that we can add to that characterization is the earnest hope that those who have not yet attended any of the Technical Section meetings will not let the next opportunity go by. The pulp and paper makers have come together with a spirit of camaraderie very seldom equalled, and any man who stays away is missing one of the greatest privileges which his profession affords him. And, by the way, the general manager or president who "just doesn't see" the advantages of making it easy for men to get away to these meetings is making a terrible mistake. Canada has had enough of pulp and paper enterprises which were created for the purpose of making money first, and finished product afterwards. Not only has the time come when the best efforts of paper makers are needed to put the industry upon the plane where it should be, but the close study of basic principles and the employment of the very cleverest men by some companies are demonstrating to the world that Canada stands in the forefront of the pulp and paper making countries.

Just two weeks before the meeting of the Technical Section, Mr. Theo. H. Wardleworth addressed a luncheon meeting of the main Association in Montreal. The gist of his remarks upon the dyestuffs problem has already appeared in these columns. What he said by way of advice to the gentlemen assembled, in the light of conditions which have been disclosed by the great war, was even more valuable. In effect his counsel was, "Give all the encouragement possible to the Canadian scientist, co-ordinate your manufacturing with modern science, and do everything in your power to build up Canadian industry upon the basis of science." The time has come when no one needs to be afraid of the "scientist" unless it be to compete with him. Far from being a whimsical bookworm or an idle theorist, the scientist is the man who stands to-day at the very head of industry. Science is defined as "classified knowledge," but in the course of classifying, its devotees, if true, are absolutely logical, thoroughly accurate and always open to conviction. Further, they are unwavering and untiring in their efforts to get at the foot of things.

One can hardly read such a paper as that of Dr. Johnsen, in the following pages, and fail to be struck with the strong, clearly defined scientific attitude of the writer. Dr. Johnsen's paper in a measure embodied the spirit of the meeting. The signs were many and unmistakable; in the papers, the discussion and in conversation, that indescribable "something" which betokens the scientific bent was ever present.

The Technical Section will grow in strength as naturally as a tree in a good soil. The growth may be quiet, but it will be vigorous. May the members of the pulp and paper industry realize their responsibilities and their opportunities in this basic work.

Newspapers versus Magazine Readers

A discussion has been taking place between some of our leading newspapers and magazines as to whether or not the number of magazine readers is falling off. The general concensus of opinion seems to be that there has been a decrease in magazine reading during the past few years. This is partly due to war conditions, and a general desire on the part of the public to economize and partly to the fact that many of the better newspapers are now featuring magazine articles.

One of the leading daily newspapers in the United States, in calling attention to its Sunday magazine section, makes this statement, "no better articles appear anywhere in any magazine than appear in these pages." To a lesser extent this is true of all our metropolitan dailies.

To-day some of the best writers in the world are contributing to the daily papers in preference to magazines. This, of course, may be a disadvantage, and their contributions may lack the finish, the rounded paragraphs, the fine peroration obtainable in magazine articles, where more leisure and greater effort has been spent, but at the same time the daily paper has a directness and a force which the magazine lacks. For example, most of the articles on the war have been appearing in the daily papers in preference to the magazines. This applies to a discussion of the economic phases of the war as well as to the political, strategic and historical aspects.

Canadian pulp and paper men are interested in this question to a marked extent. If newspaper reading is on the increase, and magazine reading on the decrease, it means that there will be a bigger demand for newsprint and a decreased demand for book and writing paper. In Canada we produce approximately 460,000 tons of newsprint per year, and only 40,000 tons of book and writing paper. An increase in the consumption of newsprint affects ten times the interests that a similar increase in book paper would affect. Even if there is a tendency to do less magazine reading, the change is not likely to come about so rapidly as to affect the economic status of our various paper mills. Such a change will be gradual, and will give the mills affected ample opportunity to adjust themselves to the changed conditions. However, since the campaign has been started, manufacturers of newsprint and book and writing paper will probably pay closer attention to the respective lists of newspaper and magazine readers, and be able to form their own conclusions in regard to the merits or demerits of the controversy.

Business is Better.

Enquiries made of pulp and paper men indicate that business is showing a considerable improvement over the conditions prevailing during the past few months. In some respects the pulp and paper industry has been one of the most adversely affected. As soon as war broke out, newspapers all over the country found their advertising seriously curtailed, while the cost of news gathering, especially cable news, showed an enormous increase. The result was that papers were immediately forced to reduce in size and curtail in every possible manner. This had a direct and immediate effect upon the consumption of newsprint.

Advertising is a controllable expense, and can be dispensed with more easily than overhead charges, and the other factors which affect the conduct of a business. During the hard times of the past year or two, and especially since the outbreak of war, advertising has been seriously curtailed with the result, as above stated, that the consumption and output of newsprint was adversely affected.

During the past few months there has been a decided improvement, due largely to the fact that hundreds of factories are engaged in the manufacture of war munitions. The fact that upwards of $500,000,000 has been expended in the country for war supplies, combined with an exceedingly good crop in the West, and good prices for all kinds of produce has turned the tide, and to-day conditions are better than normal. There is very little unemployment in the country, while in contrast to the feeling of depression which prevailed a year ago, there is now a feeling of optimism not only regarding present conditions, but regarding the future outlook in Canada. Undoubtedly this country has benefited in an economic sense from the war. Mars, which has taken its toll of thousands at the battle front, has kept the wheels of our industries going, and has filled the dinner pails for tens of thousands of families. The influx of British and foreign capital for war supplies has eased the economic burden from which this country was suffering as the result of over-speculation and too rapid expansion. The whole country has slowed down a bit, has learned to economize, and is to-day in a much better position to go ahead than at any time in the past dozen years. Altogether the outlook is most encouraging, and pulp and paper men are sharing in the improved business conditions.

MEETING OF THE TECHNICAL SECTION

LARGELY ATTENDED SESSIONS IN MONTREAL, NOVEMBER 19th.

The Fall Meeting of the Technical Section of the Canadian Pulp and Paper Association was held in the Forest Products Laboratories of Canada, Montreal, on November 19th.

The register showed that the following were present at some or all of the sessions: –

Robt. B. Best, Process Engineers, Ltd., Montreal.

Frederick Barnes, Belgo-Canadian Pulp & Paper Co., Shawinigan Falls.

John S. Bates, Forest Products Laboratories of Canada, Montreal.

H. E. Bell, E. B. Eddy Co., Ltd., Montreal.

R. J. Blair, Forest Products Laboratories, Montreal.

A. O. Bowness, E. B. Eddy Co., Ltd., Hull.

O. F. Bryant, Forest Products Laboratories, Montreal.

C. F. Buss, St. Lawrence Paper Mills, Mille Roches.

P. Byrne, Riordon Pulp & Paper Co., Merritton.

Roy Campbell, Canadian Pulp & Paper Association, Montreal.

A. B. Cooper, Forest Products Laboratories, Montreal.

J. A. DeCew, Process Engineer, Ltd., Montreal.

Joseph A. Fux, Waterous Engine Works Co , Ltd., Brantford.

E. S. Holloway, Canada & Gulf Terminal Ry. Co., Matane, P. Q.

R. W. Hovey, Forest Products Laboratories, Montreal.

Prof. H. O. Keay, McGill University, Montreal.

W. L. Ketchen, Riordon Pulp & Paper Co., Hawkesbury.

H. N. Lee, Forest Products Laboratories, Montreal.

Geo. M. McKee, The Donnacona Paper Co., Donnacona.

J. L. McNicol, Forest Products Laboratories, Montreal.

P. J. Murer, Riordon Pulp & Paper Co., Ltd., Hawkesbury.

S. Norman, Riordon Plup & Paper Co., Ltd., Hawkesbury.

Wm. F. Norton, Canadian Leatherboard Co., Chambly Canton.

H. A. Radford, Process Engineers, Ltd., Montreal.

C. de Wolfe Reid, St. Lawrence Paper Mills, Montreal.

Carl Riordon, Riordon Pulp & Paper Co., Montreal.

Olivier Rolland, The Rolland Paper Co., Ltd., St. Jerome.

E. B. Slack, Riordon Pulp & Paper Co., Ltd., Hawkesbury.

W. H. Smith, Bureau of Standards, Washington, D. C.

J. Stadler, Belgo-Canadian Pulp & Paper Co., Shawinigan Falls.

T. J. Stevenson, Riordon Pulp & Paper Co., Ltd., Montreal.

H. S. Taylor, Spanish River Pulp & Paper Mills, Sault Ste. Marie.

C. B. Thorne, Riordon Pulp & Paper Co., Hawkesbury.

J. Tomita, Tokyo, Japan.

S. Wang, Riordon Pulp & Paper Co., Hawkesbury.

Herbert C. Wells, Canadian Leatherboard Co., Chambly Canton.

Edward Wright, Beaver Wood Fibre Co., Thorold, Ont.

Dr. Bates presided.

The minutes of the meeting of June 19 were read and approved, and the minutes of the Executive Council of October 8 and the list of members as approved by the Council, were also read.

The Chairman then called for the reports of the Committees. Mr. T. Linsey Crossley reported for the Committee on Technical Education; Mr. C. B. Thorne for the Committee on the Collection of Samples; Mr. J. A. DeCew for the Committee on Standards and Method of Testing, and Mr. O. F. Bryant for the Committee on Literature and Statistics. None of the reports were in a form which required adoption, but were discussed freely as will be seen below.

REPORT OF COMMITTEE ON TECHNICAL EDUCATION.

Your Committee has found this question a very broad one and this report is in the nature of a general survey of conditions and possibilities.

In approaching the subject of technical education in the Canadian Pulp and Paper trade, we have to study several aspects of the subject and their relationship to existing conditions.

Some of these Phases are:

(1) Existing provisions for technical education in Canada, and their adaptability by equipment and staff to use in the paper industry.

(2) The approximate paper trade population of Canada, and its distribution.

(3) How could existing facilities for technical improvement be made available to those now employed in the paper trade, or who anticipate, and wish to prepare for such employment?

(4) What are the avenues along which advance might be made in the industry along educational lines?

(5) What equipment or staff would be needed to carry on this work?

(6) What line of action would be most rapidly productive of results presuming that it be considered desirable to take up only one line of activity at present?

These points in detail present the following considerations.

(1) Existing Provisions.

Well equipped technical schools are established in Montreal, Halifax, Toronto, Winnipeg and other centres. Any of these could be used for paper and pulp instruction by the addition of a small experimental equipment.

(2) Pulp and Paper Population of Canada.

Fifteen thousand is probably a conservative estimate of the people directly dependent on the Paper and Pulp Industry—that would mean 3,000 to 3,500 families and about 4,000-5,000 individuals actually working. Probably one child in each family is destined to work in the paper or pulp mill of the home town. Of the total of 15,000 people, probably 12,000 are east of Fort William. About two-thirds of these are in two large areas one of which centers a little north of the Niagara Peninsula and the other about Montreal. A hundred mile radius from Hamilton, Ont. and 125 mile radius from Montreal would include therefore about two-thirds of the Paper population of Canada. Outside of these two areas there are large but more or less isolated plants.

(3) How Could Existing Facilities be Made Available (a) to Men now Employed?

This must be either by correspondence, night classes, or leave of absence to study. In some mills a room could easily be set apart for the use of men in the mill, to be open only at certain times, say two or four o'clock in the afternoon for men on night tour and eight to ten for men on day. Shelves, a large table and chairs would be the only furniture: paper, ink, and a few books, with two or three technical journals the only supplies, the whole in charge of a Committee of men in the plant who are members of the Technical Section ,who would see to it that the room was used for educational purposes. Your Committee would be glad to communicate with any mill and make suggestions. The room would be particularly for use in correspondence work, not necessarily paper technology, but courses in draughting, chemistry, machine, design, efficiency, etc. To make this form of work successful it is essential that there should be some executive center to refer to and some one person in each mill who is thoroughly interested to keep in touch with that center. For the present, we believe this Committee could handle that work. Eventually it is hoped that a paper making school will be founded in Canada and to the men interested in the mills, scholarships would be allotted by vote of their fellows and paid for by the Companies.

(b) To those who expect to be employed in mill work. From the local schools scholarships to city technical schools or college engineering courses could be given with the understanding that on graduation the holder of the scholarship would enter the employ of the company granting it. The basis for the scholarship award might be the aggregate standing of the pupli in Arithmetic, Mensuration, Algebra, Geometry, Physics, Chemistry and Manual Training.

(4) What Avenues of Advance are Indicated?

(a) Vocational Education in primary schools continued into High Schools.

This work especially applies to schools in Mill communities where the probability is that many of the pupils in the schools will ultimately be employed in the mills. Such towns as Mille Roches, Grand Mère, Thorold, &c., might with advantage institute this work.

(b) Work Among Men Actually Employed.

The suggestions made in 3 (a) apply here. One of the difficulties of correspondence school work is the cost to the individual. Many of the married men could not afford the money but would like to increase their earning power by study. Some arrangement might be made by the mill with one of the wellknown correspondence schools.

(5) Equipment and Staff.

This look like a big problem and it certainly is, but it is advisable not to consider too great a step at present. Possibly for two or three years, one man, with a good stenographer, a small office and a good filing system, could mobilize our facilities for technical education. This man need not for the present at least be expert in any one of the branches of pulp and paper work, but should have experience in mills, and be able to lecture and discuss questions in the simpler mathematics, physics, and chemistry.

(6) What Line of Action Most Rapidly Productive.

We would for the present eliminate from discussion the question of University work. The Universities will handle that themselves if we create a demand. We believe that for the present we can get the best results by attacking the schools and the mills.

We would suggest that some community, where Pulp and Paper are dominant industries, inaugurate a system of vocational education with the assistance of the local school board and teachers. The Technical Section could also have prepared several sets of slides which could be loaned to members of the section who would give lantern talks at the schools. The suggestion of a special room in the mill seems practicable. At the outside it must be understood that the paper-maker is not to be instructed in paper-making nor the sulphite cook in sulphite cooking, but in both cases what is desired is a broadening of each one's knowledge of the relation of his work to the science back of the industry.

In concluding the sketchy outline, your Committee is of the opinion that the first duty is to get an idea of the demand by actual communication with each man and endeavouring to get an expression of desire to improve in technology.

DISCUSSION.

Following the report by Mr. Crossley, Mr. J. Stadler of the Belgo-Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, Que., spoke upon the difficulties which stand in the way of technical education in Canada. He instanced the Technical Institute which had been established in Shawinigan Falls by the Shawinigan Water & Power Company. This institution which had been originally constructed by the Company at a cost of $50,000, which is supported by the Company to the extent of $6,000 per annum out of a total running expense of $10,000 per annum, is not succeeding very well. The Institute has endeavored to take up subjects which will be of direct value to the younger generation in the town who are likely to go into the industries in Shawinigan Falls. Mechanics, mathematics and other elementary subjects have been given attention but a great difficulty is encountered in the fact that the boys, all of whom are over 14 years of age, lack the basic instruction which will enable them to profit by the courses given. It has taken four years of steady persistent effort to get a serious interest on the part of the boys in the work of the school. Counter attractions, such as sports, have always caused the attendance to drop perceptibly in the winter season. An effort had been made to provide education in chemistry but primary education was not sufficiently good to allow progress, and the course had been drop-

ped. Mr. Stadler estimated that 60 per cent of the boys who were eligible for instruction were illiterate, and among them there seemed to be no ambition to learn or reach higher stations in industrial life. Mr. Stadler was of the opinion that the same would be found true in a great many places in Canada, particularly in the Province of Quebec. In a town in Belgium of the same population and similarly developed industrially, 600 pupils attended night school as against 40 in Shawinigan Falls.

Mr. Stadler therefore urged the Committee dealing with the question of Technical Education to put their work on most basic principles and endeavour to bring up the general standard of education.

Mr. Geo. M. McKee, General Manager of the Donnacona Paper Company, when asked for his opinion by the Chairman, said that he agreed with Mr. Stadler in his estimate of illiteracy in the smaller towns in Quebec. He agreed with the Chairman of the Committee that there should be an effort made to provide a central bureau for exchanging information and an Instructor for assisting men in the mills.

Mr. C. B. Thorne of the Riordon Pulp & Paper Co., Ltd., Hawkesbury, made a plea for more text books of a primary nature in subjects of interest to pulp and paper workmen. He thought that a great deal might be done through co-operation of correspondence schools already in existence. He believed that the estimate of illiteracy was not exaggerated.

Mr. H. S. Taylor of the Spanish Pulp & Paper Mills, Sault Ste. Marie, said that his town was better situated than either of those referred to, probably on account of the fact that industries had been in it for a longer time and that the steel companies who had been there, had made great efforts to secure higher degree of education among its younger employees. He pleaded for a greater degree of co-operation by the management of pulp and paper mills in helping worthy students to advance. Good results had been obtained by providing education expenses for those who showed a willingness to work and to stick loyally by the firm.

REPORT OF COMMITTEE ON THE COLLECTION OF SAMPLES.

Mr. C. B. Thorne in his report for the Committee on the Collection of Samples, explained that it was not possible to give a very conclusive report, as answers to the letter sent out by the Committee had not been received from all mills. A communication had been sent out to all mills outlining the plan for the collection of samples and asking for promises of co-operation before the costs were estimated. This plan, Mr Thorne explained, had not proven very successful, and it would now be necessary for the Committee to secure as accurate an estimate as possible of the cost per sample of printing and binding. Strong approval had been expressed in many quarters, of the plan, and Mr. Thorne was hopeful that the mills would respond quickly to the proposals made.

Discussion.

Mr. H. S. Taylor asked if the Technical Section were exceeding its province in spending money on the collection of samples. When the proposition was one in the nature of advertising Canadian products, should not this undertaking be carried out by the main Association?

Mr. Olivier Rolland expressed the opinion that the Technical Section should indeed undertake this work as it is very desirable for the technical men to see what now exists so that comparisons may be made and improvements effected.

Mr. Thorne repeated the assurances that Mr. Weldon, President of the Association, had given him that the project was a most worthy one and should be supported by the mills.

Mr. T. L. Crossley agreed with Mr. Thorne, saying that initiative seemed desirable and that the Technical Section could do this work quite satisfactorily.

Mr. J. A. DeCew expressed the fear that possibly the mills might not co-operate because the plan might not be thoroughly understood, and the question of grade and price might not strike the mind of those seeing the sample books. Some mills might be concentrating on low grades at low prices and their products might not look well beside a high grade product at a high price. The comparisons would therefore be invidious.

Mr. Thorne replied that the mills would send the samples of paper which they wished to push. He agreed thoroughly with Mr. Weldon in his idea that the country would be well advertised by such a collection of samples.

Mr. Rolland pointed out that possibly a really fine collection gotten up in an expensive way was not absolutely necessary. A collection might be had for distribution among the members only.

Mr. Stadler pointed out that the mills should be willing to send samples. They are always ready to send some upon request and there was no valid reason why the collection as outlined should not be made providing the expense is not prohibitive. He urged that the Committee go ahead upon the scheme as outlined by Mr. Thorne.

Mr. Taylor suggested that the scheme be made a little more definite and that the mills be written to, to show exactly the plan which would be finally adopted.

Mr. Thorne said that they would ask suggestions from all mills and act mainly upon them in carrying out the work.

REPORT OF THE COMMITTEE ON STANDARDS AND METHODS OF TESTING.

Mr. J. A. DeCew, Chairman of the Committee stated:

Your Committee on standards are able to report something regarding the plans of work for the coming year, although, owing to the fact that, that the Committee has been but recently fully organized, the work already done is merely of a preliminary character.

The special object of the Committee in their first year's work, will to be collect and harmonize, as much as possible, the methods of testing which applies specifically to paper making materials.

The Committee have discussed various suggestions regarding standardization of Pulp & Paper Stock and the subject is one which will require great development before any definite specifications can be submitted.

The work on the methods of Testing, however, will naturally develop towards this end.

The Chairman of your Committee has had the opportunity to discuss some phases of the subject with those gentlemen in the U. S. who are organizing similar work on the behalf of the Technical Section of the American Pulp & Paper Association.

Although we contemplate developing the subject along these lines which we feel will be of greatest

benefit to Canadian Paper Makers, yet we expect that the work done in behalf of both the Canadian and the American Associations will naturally follow on somewhat similar lines.

The Committee would be pleased to receive suggestions from any Canadian Paper Manufacturer regarding any special products which he may consider of sufficient importance for early consideration and is quite willing to give full discussion to any request of this kind.

We trust that at the next regular meeting we will be able to submit a report which will initiate this work and upon which we may receive some general discussion.

Discussion.

Following the report by Mr. DeCew, Dr. Bates called upon Mr. W. H. Smith of the United States Bureau of Standards at Washington, D .C., who was among those present, to give his views upon the question of standards. Mr. Smith outlined briefly the work of the Bureau of Standards and spoke on the efforts which were being made to secure the uniformity for which Mr. DeCew had pleaded. He extended an invitation to all those present to visit the Bureau at any time they were in Washington.

Dr. Bates spoke of the excellent work being accomplished by the Bureau, of which Mr. Smith is a member, and of the co-operation desirable with the American Technical Section, and also volunteered on behalf of the Forest Products Laboratories, the fullest co-operation with the Committee in arriving at good results.

REPORT OF THE COMMITTE ON LITERATURE AND STATISTICS.

Mr. Bryant in his report on the work of the Committee on Literature and Statistics, pointed out how vast was the field allotted to them. After a great deal of study of the problem it had become patent to the members of the Committee that the only way in which the journals of the pulp and paper industry could properly be handled for the benefit of all members of the Association, was to have a paid Abstractor on the plan adopted by "Chemical Abstracts". The subjects,—Author, Publication and Abstract would all be joined together to give each member of the Section as accurate an idea as possible of each article. These abstracts might be published in the official journal of the Section and reprints sent to all members. The problem had been discussed with members of the Technical Section of the American Association and the fullest co-operation had been promised. Mr. Bryant was of the opinion that it would be desirable to have the two Sections join together in this work, and to go at it most carefully and thoroughly.

Discussion.

Mr. C. B. Thorne was of the opinion that the mills would readily co-operate and would be glad to give a reasonable sum of money annually towards the salary of an Abstractor.

The Chairman gathered that the sense of the meeting was, that while financial support would be given to the Committee on Literature and Statistics in the development of their ideas, that it would be well to wait until the plan was fully matured before any money was voted.

Business.

Following the transaction of business, in which the principal point of interest was the decision to charge no fee for the balance of 1915 to those who apply for membership after the time of the meeting, Dr. Bates pointed out of the necessity of the wholehearted support of members in preparing the programme for the next annual meeting. It was difficult, he said, to secure papers on account of the natural reticence of most of the members, but he emphasized that this would have to be overcome if discussions were to be most profitable.

The meeting adjourned.

After a pleasant hour over luncheon at the St. Regis Hotel, where 23 members sat down together, the meeting was resumed to listen to papers by Dr. Bjarne Johnsen and Mr. J. A. DeCew.

Chemical Analysis of Wood Pulps

By DR. BJARNE JOHNSEN,

Paper presented at the meeting of the TECHNICAL SECTION of the Canadian Pulp and Paper Association, Montreal, November 19th., 1915.

Before I pass on to the essential subject of my report, some characteristics of the commercial wood pulps, I shall, according to a request from your Chairman, Dr. Bates, try in a few words to give you some information with regard to the education of engineers for the pulp and paper industry in Germany.

The Germans recognize the necessity of educating men fit for the different positions in pulp and paper mills, in three classes; one for technical managers, another for superintendents and also one for foremen. According to this they have three different schools, each of them educating the students for one of the three positions mentioned.

About ten years ago a special division for educating papermakers was founded at the Technical University in Darmstadt and after a short while a great number of students, also from many foreign countries, gathered at this school, where two of the greatest authorities on the chemistry of cellulose and on the construction of machines for papermaking, namely Professor Schwalbe and Professor Pfarr, were at the head of this new division.

To be admitted as a regular student at this school the certificate of maturity (granted to the student on passing the final examination of a German first-class school) is demanded and every student must, to be admitted to the final examinations, have been in practical work in pulp and paper mills, as well as in a machine shop for at least two years. In the first two years lectures on mathematics, physics, machine drawing, inorganic chemistry and engineering are attended, and the time not occupied by lectures is used for work in the laboratory of physics and inorganic chemistry. Then, after passing the first examination the following two years are devoted especially to lectures and exercises on electrical engineering, raw materials and machinery for the paper industry, organic chemistry, especially the chemistry of cellulose, including dyeing of fibres, test-

ing of pulp and paper materials, and so on. General lectures upon engineering are also attended by the students, most of the time, however, being reserved for working in the laboratories.

In addition to the general laboratories the school in Darmstadt has excellent laboratories especially for papermakers, including a laboratory for the chemistry of cellulose, equipped with apparatus for cooking of soda as well as sulphite pulps, thus giving the students an opportunity of getting acquainted with the different cooking processes and enabling them to do research work. In the machine laboratory where most of the machinery used in the papermills is found, a small paper machine is erected of about the same size as installed at the Forest Products Laboratories of Canada. A paper testing laboratory contains the apparatus for mechanical and microscopical testing.

Before entering into the final examination, after which the student gets the degree of a "diploma engineer", he must, unassisted, carry out a research work in one of these Laboratories.

The education at the second school for papermakers, in Cothen, is not based upon the same amount of knowledge as at Darmstadt, but the Laboratories here are also very well equipped and the young engineers have, when leaving this school after a course of about three years, a very good practical and theoretical education. In Altenburg they have a school which gives men the elements or pulp and paper making, enabling them to take positions as foremen in the mills.

Since Schwabe left Darmstadt in 1912 to take charge of the Faculty of Chemistry in the Academy of Forestry at Eberswalde, I consider that place as being the centre of researches upon cellulose in Germany. The Government has erected, in addition to the chemical laboratories, a station for scientific experiments, which could be better characterized as a small pulp mill, established with all machinery for the soda as well as for thes ulphite processes.

Seeing that a thorough description of these Laboratories is published in some of your journals, I do not consider it necessary to describe them to you here, but you will allow me to hand over to you a paper* containing the pictures of some of the machines, showing them more distinctly than the said journals.

I mention these laboratories in connection with education, as several engineers, after having finished their education in Darmstadt, and also engineers who have been working for years in the industry, are allowed to work out their ideas here under excellent control from a scientific, as well as from a practical point of view.

I now pass on to the subject which I have selected for my paper to-day and which has for a long time interested me, and I suppose it may be of general interest in these days as the standardizing of methods for testing materials in our industry is an active question.

About two years ago I carried out research in the Laboratories of Eberswalde upon the chemical qualities of different kinds of wood pulps, the results of which have not yet been published. It would lead me too far if I should go into details of the work and supposing that many of the gentlemen present after a heavy lunch would not care to digest too much chemistry, I shall try to give you some of the results obtained, especially describing the principles of determining cellulose in wood pulps, in such a form that it might be easily understood also by those who are not chemists, leaving it to another opportunity to publish the work in full.

*Paper-Zeitung, No. 5. Jan. 17th. 1915.

As is known, cotton is considered as the purest form of cellulose. Some years ago a small amount of Egyptian Maco-cotton was carefully purified in the laboratories in Darmstadt, and the results of researches upon the product, which must be considered as the purest cellulose ever investigated, as well as researches upon its decomposition products, in connection with the results of numerous scientific works of former years have considerably enlarged our information as to the effect of chemical reagents upon this cellulose. The chemical formula has yet not been exactly determined, but the knowledge of the chemical properties of cotton cellulose enables us now, by means of analytical methods, to test the qualities of a cotton.

These methods have, in some cases, successfully been applied to wood cellulose, although we are not able to affirm that the cotton cellulose and the cellulose contained in the woods are identical.

Considering the important part which the wood pulps are playing as a raw material in the manufacturing of paper, very little has been done on their investigation. For different kinds of paper quite different chemical and physical qualities of the wood pulps are demanded, or ought to be demanded. But not only the manufacturing of paper requires this raw material, for great industries in which wood pulps have replaced the cotton, as for instance the artificial silk, the celluloid and film industries, and as it seems recently also the manufacture of explosives, wod pulps of a certain degree of purity and certain chemical and physical qualities of fibres are now used. It should, accordingly, be reason enough to encourage research on these materials, and the influence of the different cooking processes upon the product. However, the difficiulties are many, one of the most remarkable being our insufficient knowledge of the raw materials, the woods, in spite of the eminent works of Klason and of Cross and Bevan upon this subject.

The cooking processes, by which the removal of non-cellulose substances should result in a pure cellulose, deliver us products which still contain more or less of the impurities of the wood. These could roughly be described as lignin, furfural-yielding substances, fat and rosin and in most cases small amounts of oxy-and hydro-cellulose.

Close investigation of Cross and Bevan, Klason and others have certainly thrown some light upon the chemistry of woods but they have also made evident that much work has to be done before great problems in the discussion of the composition of wood are cleared up, such as the composition of lignin—whether this is a uniform substance or a mixture of various kinds of lignins, — the nature of the furfural-yielding substances and the question of whether the impurities are chemically combined with cellulose or are present as incrusting materials. These impurities being by the different cooking processes more or less imperfectly removed, the possibility of their quantitative estimation in the pulps was one of the matters which I tried to work out.

The colour reactions used in practice for identification of lignin are not always of great value, some of them, as it seems, depending upon certain substances which are representing only a small portion of the lignin materials. I may, by the way, mention that the typical phloroglucin reaction in many cases is not obtained, where other reactions prove the presence of lignin, nor do the color-reactions give much information as to the amount of lignin present. Here a quantitative determination is necessary.

Typical for the lignin is the methoxyl group and there-

by also the property of splitting off a certain amount of methyl iodide, when heated with concentrated hydroiodic acid. Determining the yield of methyl iodide obtained by various kinds of commercial wood pulps it was observed that the amount of methyl varied from 0.5 per cent to 0.07 per cent, without any characteristic difference between the soda and sulphite pulps. It is interesting, however, that the soda kraft pulps varied but very little in percentage of methyl from common soda pulps, and also that during the bleaching process the amount of methyl is reduced, in other words, lignin is removed due to the oxidation.

A great number of colour reactions were tested for their value as lignin reagents, the result being that the reaction with chlorine gas and sodium sulphite as well as the potassium permanganate and hydrochloric acid test could be considered as the most typical reactions.

I do not mean to propose the methyl iodide test as a daily test in the mills, the method requiring more patience, exactness and time than many of the chemists now used in the mills are able to give, and also the cost of concentrated hydro iodic acid and silver nitrate (the chemicals required) being high. In my opinion, however, this method for determination of lignin should always be used when an exact analysis is required, taking into account also insignificant quantities of methyl obtained from methyl pentosan, also present in most pulps, the amount of which could easily be determined.

A typical difference was ascertained between soda and sulphite pulps in their yield of furfural; when heated with hydrochloric acid of specific gravity 1.06, the figures lying for sulphite pulps between 2 per cent and 2.7 per cent and for soda pulps between 3.8 per cent and 8.1 per cent, I found it practical to use this difference in working out a method for distinguishing between the two kinds of pulps.

My results here are contradictory to former statements of Professor Tollens, according to which the yield of furfural should be higher by the sulphite pulps. As, however, all my analyses were performed in exactly the same manner I have no reason for having any doubt as to these results, and it is interesting that Mr. Smith, from the Bureau of Standards in Washington, who is present here to-day, and with whom I had the pleasure of talking over this question yesterday, had made the same statements as I. As I understand, Mr. Smith has carried out a research work along the same lines, and we may with interest look forward to the publishing of this work.

The reason for such varying results as above mentioned may be sought in slight diversity in the performance of the analysis, researches of recent years having proved that small modifications in this method affect the results considerably. A standard method ought here to be established.

The nature of the furfural-yielding substances in woods and pulps has often been discussed. In general this reaction is regarded as typical of the pentosans. As, however, materials from which the pentosans are removed and which also contain no lignin, still give furfural when treated with hydrochloric acid, the reaction must be due to certain other substances,which seem to be very closely combined with cellulose. Cross and Bevan have traced this quality back to so-called furfuroide, — substances yielding furfural by hydrochloric acid, but in contrast to the pentosans are fermentable and do not give the other typical reactions of pentosans.

Cross and Bevan also mentioned the oxy-celluloses as furfural-yielding materials and some oxycelluloses seem to have been produced possessing this property. As, however, this question has lately been so often discussed I considered it of interest to analyze the most typical oxycellulose obtained by treating cellulose materials with chloride of lime, which oxycellulose is most important to the pulp and paper manufacturers, being formed especially in the bleaching process. My results, that this oxycellulose did not give furfural, call attention to the difference of various kinds of oxycelluloses.

The determination of rosins in pulps through extraction with ether and alcohol did not lead to results of common interest. I shall only in a few words mention that soda kraft pulp contains considerably much more rosin, especially alcohol rosin, than other soda pulps. It may be that the form of this rosin is one of the factors on which the enormous strength of kraft papers depends.

I have now mentioned the possibility of determining the chief impurities in wood pulps and shall in the following go into the question as to how these impurities might be removed, leaving the cellulose undamaged.

It is impossible here to take up the discussion upon the great number of analytical methods proposed from time to time for the determination of cellulose in wood substances. The report of the Committee on Analysis before the Seventh International Congress of Applied Chemistry, London, 1909, gives evidence of the uselessness of some of these methods. I may also refer to the critical work of Dr. Renker in which he enters into full particulars upon the different methods, finding that the method of chlorination as proposed by Cross and Bevan remains the only one which gives constant results and which is suitable for practical use. After Renker's work was published Professor Konig took up the question, claiming that the purifying with chlorine gas is incomplete, only the lignin and a small portion of the pentosans being removed, while the larger amount of furfural-yielding substances is left in the material. In opposition to this Konig regards his method and the method of Professor Tollens as the only ones able to remove lignin as well as all the pentosans. Konig also claims that for the removal of pentosans a hydrolysis is necessary and that by an oxidation chiefly lignins are removed. These statements could also be verified during my work but the way in which this object, by the said methods, is secured, seems to me as being less advantageous.

As hydrolyzing acid Konig uses 2 per cent sulphuric acid in glucerine, heating the material in this solution at 137 deg. C. (3 atmospheres pressure). Afterwards it is oxidized with 3 per cent hydrogen peroxide. Tollens hydrolyzes alternately with 1.25 per cent potassium hydroxide and 1.25 per cent sulphuric acid at boiling temperature, oxidizing afterwards with nitric acid of specific gravity 1.10 at 80 deg. C. digesting at last with 2 per cent ammonia. Considering that even cotton cellulose is attacked by very dilute mineral acids it was easy to prove that the cellulose products obtained were highly damaged, these containing great amounts of oxy-and hydro-cellulose. As also observed during my work an alternating treatment with alkali and acid attacks the cellulose very considerably, and thus these methods are especially disadvantageous when used upon soda cellulose.

In working out a new method for determination of cellulose in wood pulps I considered the reduced capacity of resistance of these celluloses according to the different cooking processes. Some preliminary examinations showed that the mineral acids cannot be used upon all pulps, on the other hand the organic acids, especially acetic acid, do no harm to the cellulose. As oxidizing agent, nitric oxide gases were used, which

are evolved when dilute sulphuric acid is poured into a dilute solution of sodium nitrite.

A treatment with glycerine appeared to be advantageous, this, as I found, at the same time extracting the rosin and causing the fibres to swell up, thus rendering it easier to the chemicals to penetrate.

For the determination the fibres are placed in a flask with a mixture of glycerine and acetic acid and heated in an oil bath at 135 deg. C. for two hours. Afterwards the fibres are washed with hot water and transferred to a small bottle with air-tight stopper into which is poured dilute solutions of sodium nitrite and sulphuric acid and shaken for about half an hour. Then the material is digested on a water bath after having neutralized with alkali. The fibres, being now free from lignin and pentosans are washed in a crucible with perforated disk, dried and weighed. The cellulose thus obtained still gives some furfural but this is certainly due to substances which are so closely (perhaps chemically) combined with the cellulose, that their removal without damaging the cellulose is impossible.

This new method, as well as all analytical researches mentioned above, were performed with soda-kraft and common soda pulps and unbleached and bleached Ritter-Kellner and Mitscherlich pulps from Canada, United States, Germany, Norway and Finland and also with pure cotton cellulose, this latter giving a yield of 99.88 per cent cellulose.

The new method would not be of practical use for wood, owing to the weak action of the reagents, but in my opinion a method will never be found which could advantageously be used on wood as well as on the rather pure wood pulps. For wood the method of Cross and Bevan as recently modified by Dr. Sieber is still the best. It would, however, surely be of importance to improve this method by introducing a preliminary hydrolysis, perhaps with acetic acid in glycerine. In carrying out some research work in the near future I shall have my attention upon this object.

The result of the determinations by different methods for two pulps are shown in a table showing the different yield of cellulose and also the copper figures which give the amount of reducing substances in the cellulose, here oxy-and hydro-celluloses, formed by the different methods.

The fibres are boiled in Fehling's solution for fifteen minutes and washed out with hot water on a Buchner funnel. The cuprous oxide is dissolved in nitric acid and the copper determined electrolytically.

The amount of copper reduced by 100 grams of fibres gives the copper figure.

I am sorry I left in Europe some photomicrographs of the purified cellulose. These are very interesting, showing more distinctly the damage of cellulose by the methods of Tollens and Konig, while the new method gives nice pure fibres.

Genelemen, you will see by this work that very little has been done on the chemical investigation of the commereial celluloses, and that it is of considerable importance that research work along this line is undertaken. The interest in the chemistry of our industry seems, however, to be increasing as the Governments as well as many mills having in the last years erected laboratories for this purpose. Many interesting results have come in recent years, especially from mill laboratories, and it will not be necessary for me to call your attention to the importance or even necessity of co-operation between the scientific laboratories and the laboratories of the mills if we should dare to hope in the near future to see in our industry successes similar to thosew hich chemical research work has gained in other great industries, in the manufacturing of dye-stuffs and sugar, and in the industries absed upon fermentation.

TABLE SHOWING ANALYTICAL RESULTS BY DIFFERENT METHODS ON KRAFT AND SULPHITE

	Cross & Bevan		Konig.		Tolen's,		New Method	
	Copper Figure	Yield %	Copper Figure	Yield %	Copper Figure	Yield %	Copper Figure	Yield %	Copper Figure
Kraft Pulp	1.2	94.83	1.59	82.4	4.11	77.65	6.04	91.55	1.02
Rittner - Kellner sulphite pulp	2.26	96.75	2.67	86.0	2.78	90.18	3.88	92.07	1.45

Discussion.

Dr. Bates pointed out the importance of pure chemical research in the pulp and paper industry because difficulties which are constantly arising could very often be traced to a lack of knowledge of the minute chemical reaction of halfstuffs. Further, he urged that the industry would progress largely in proportion to the extent to which this subject was given attention. The Forest Products Laboratory at Madison, Wis., and the Bureau of Standards at Washington, D. C., have taken up this work and it was important that Canadians should do the same.

Mr. Smith stated that Dr. Johnsen's remarks had been of very great interest to him because he had been personally interested in a work which was practically the same, and was happy to see that his results corroborated those of Dr Johnsen. The United States Bureau of Standards, said Mr. Smith, was now 15 years old with a technical staff of 175 as against 3 at its inception. The investigations covered all branches of manufactures, and standards were arrived at for strengths, mechanics, optics and so on. In the lines of paper manufacture the efforts had been to enable improvements to be made in the methods of paper manufacture. Such problems as the determination of the superiority of rag stock had been investigated. Attempts had been made to discover how much better rag stock is than sulphite and what the differences are. Scientific specifications for standards had been laid down.

Experiments had been conducted with rag halfstuffs and sulphite halfstuffs. Some interesting results had been shown in the course of the treatment of these pulps with 1 per cent caustic solution. On the one hand rag lost 1 per cent of its weight and sulphite 10 per cent. As paper undergo changes which are quite similar to those in pulps it is very desirable to find out what the wear and tear of the commercial product really means.

Mr. Stadler, in speaking upon Dr. Johnsen's paper, said that it had been pointed out that the percentage of rosin in sulphate pulp is higher than in soda pulp. He wished to know that in the experiments which Dr. Johnsen had kindly outlined, if the percentage of excess had been in the wood before the manufacturing process or if the divergence was due to the tests in the process.

Dr. Johnsen replied that the sulphate pulps tested

had been from various parts of the globe.—United States, Finland, Sweden, etc. and that the results were nearly all the same. Rosin is present in kraft pulp in a special form due to the peculiarities of the cooking process. The use of the kollergang process in Europe may account for a larger quantity of rosin in the pulp since less water is required.

Mr. Stadler instanced some investigations in which it was found that the percentages of rosin in the various pulps was due to the origin of the pulps. In this country the rosin percentage varies greatly. Mr. Stadler had found that the increase in strength is due to beating. Most news mills would say, if they were asked, that beating is actually carried on in the manufacture of news, but his own impression was that there was very little beating—there is only mixing. Pulp can be worked up very quickly when size is added, but when the same material is beaten without size and and with a smaller amount of water, the natural sizing elements in the wood will respond to prolonged beating to give a sheet that is more perfectly sized than that to which size has been mechanically added.

The speed at which news machines might be run was a very vexed question and the opinions upon it were very varied. Mr. Stadler himself, held that the fast running of the machine was not necessarily the source of profits. The question hinged on the value of the raw materials and whether it was economical to use greater quantities of materials and do away with the working up of those materials. If raw material is expensive it should be beaten; if it is cheap, it may be more economical not to beat. Efforts have been made to make news out of ground wood alone. Those making the attempt really have no basis, for ground wood is not made on the grinders but in the beaters. Otherwise, 30 per cent instead of 20 per cent and 25 per cent of sulphite may be necessary to attain the proper strength. If a man with both size and beat he will get good results. A good method is to grind the pulp coarse and beat. The great point is to get the full value of the sizing materials. The speaker held that a series of tests should be made to discover the fundamental principles of beating.

Recent Disturbances in the Field of Paper Making Supplies

BY J. A. DECEW.

Paper presented at the meeting of the Technical Section Canadian Pulp & Paper Association, Montreal, November 19.

All the Paper Makers present are no doubt quite familiar with the variations that have taken place in the cost of raw materials, during the present year, but some of these changes have been so recent that they are worthy of special comment, especially as the conditions in some of them of are still very unsettled.

Those raw materials we produce ourselves have naturally not undergone the same variation in cost as those chemical materials which have been largely imported, (the value of pulp stocks being practically the same as at the outbreak of the War) although there now seems to be an upward tendency in the cost of sulphite pulp. This latter is no doubt due to the reduction in importation and of recent increased consumption by paper manufacturers.

There has recently been an advance in the cost of soda ash which must necessarily effect the cost of producing soda pulp. This advance in soda ash would at present show an increase of about 20 per cent against former prices.

It is fortunate that the paper maker is not a large consumer of caustic soda, as the value of this material has increased enormously, apparently as a result of War demands. The present price being from 3½ cents to 3¾ cents per lb. against an average price of 1½c. one year ago.

The manufacturers of coated paper will be interested in the increased cost of casein which in November 1914 was worth about 8c. per lb. and during the present month is quoted at 16c. A few materials however, that are used very generally by all paper manufacturers have undergone very remarkable changes in value. The increased scarcity of some of them has hardly yet reached its maximum effect.

These sepcial materials might be described as.—Aniline Colors, Bleaching Powder, Sulphate of Alumina and Rosin.

Beginning with the last, the price of which has been exceptionally low for sometime, the rapid advance is now taking place owing to the depletion of stocks resulting from curtailed production and a general revival of the consumption by those industries using this material.

It is noted that the value of this material remained almost stationery from September 1914 until October 1915. In one month's time however, the value of this material has risen from $3.95 to $5.45 per 280 lbs. and if the demand continues at this price, it will no doubt soon be returning to its old high level of value.

With regard to bleaching powder, it has apparently taken over a year of War conditions to effect the price of this material to the consumer. It would not seem that we have reached a time when the demand has overtaken the American supply and with no European supplies available the product can hardly be secured in the open market at any price. The last quotations of which we have heard have been 5½c. per lb. as against 2.5c. one month ago and 1.3c. in September.

It is sincerely to be hoped that the scarcity will not reach to such an extent as to materially effect the production of bleached papers.

The conditions in regard to sulphate of alumina seem to be rapidly approaching a similar state of affairs. The scarcity of acid has become such that the amount available for industrial purposes has been greatly restricted, and we have seen an advance in the cost of sulphate of alumina during the last five months from the price of about 1.15 to 2½c. per lb. These

prices are naturally greater in Canada owing to the added cost of freight and duty since the English alums are now not available as a source of supply.

These prices have arisen at a time when the amount of paper produced by the mills is admittedly below normal and should the production of paper during the coming year return to its normal tonnage, the scarcity of such materials will no doubt be still greater and the costs more painful to contemplate.

The scarcity of paper colors has been equally great as that of other coal tar dyes owing to the inability to secure supplies from Germany. In this connection it might be interesting to note that in 1913 there were made in the United States a total of 3,000 short tons of coal tar colors. At the same time, 25,000 tons were imported of which 22,000 tons came from Germany.

Regarding possible supplies from the United States during 1916, it is estimated that 9,000 tons will be produced which is three times the amount manufactured in 1913, but still about quarter of the amount required. The consumption of these colors must naturally decrease in order to meet these conditions.

It is also estimated however, that by 1917 the production of dyes in the United States of 16,000 tons per annum can be reached, which would come close to taking care of the amount required at the higher prices. It will therefore be seen that by the end of another year, the Canadian Manufacturers will probably be able to secure the needed supplied of coal tar colors, but it is evident that considerable time must elapse before the price of colors will return to anything like their former level, regardless of what might otherwise transpire.

Under varying conditions of costs above mentioned, it would seem to devolve upon the technical end of the industry to develop the highest efficiency possible in the use of these materials and it is probable that the pressure of necessity may, as it has in other industries, result in many improvements in methods of using these materials.

Discussion

Mr. W. H. Smith, commenting upon the statement of Mr. DeCew on the shortage of bleaching powder said that some firms, notably laundries in the United States, had set up a small plant for making bleach electrolytically. He thought that Canadian mills might do the same in case the shortage became much more pressing. Dr. Bates observed that there is plenty of lime and plenty of electric power in Canada, and it should be easy to put the two together to make bleaching powder in the shortage of supplies.

The Chairman then called upon Mr. J. Tomita of the Oji Paper Mfg. Co., Oji Tokyo, Japan, for a few words regarding the industry in his native land. Mr. Tomita said that his knowledge of the industry and of the English language were not such as to permit of his discussing the Japanese paper industry at any length. He thanked the Canadian mills through the members assembled for their kindness in allowing him to go through the plants and to learn so much concerning Canadian manufacturing conditions.

Mr. Tomita mentioned that the Canadians producers of mechanical pulp are not confronted by the same limitations of power as are presented to the Japanese manufacturer. The mechanical problems of grinding pulp are much more important in Japan than in Canada. The speaker noted in the Dominion much greater attention to chemical problems than to the mechanical problems of paper making. The coefficient of friction between the pulp stone and the stick was not worked out in this country to the extent to which it should be, or would be if power were less plentiful. The field of the mechanical engineer is therefore large.

Mr. Tomita gave it as his opinion that high speeds were not conducive to good formation upon the He hoped to secure extensive information upon the subject of mechanical plup.

Mr. DeCew asked if Mr. Tomita could give the meeting any information regarding a fibre said to originate in Japan from which a paper is produced which can be made into garments. Mr. Tomita replied that he did not know the fibre in question, but Mr Stadler volunteered the information that he had seen some such material of this nature when he was in the near East. His impression was that the fibre came from the linden tree and was isolated originally by the soda process, and later ordinary sulphite pulp was used.

The meeting adjourned with a warm invitation by the Chairman to all the delegates to come to the annual meeting in February, and to invite any of their associates to send in applications for membership in the Technical Section.

The evening session around the dinner table at the St. Regis Hotel and later in some of the theatres, was very much enjoyed by all who participated.

Correspondence

Montreal, November 25, 1915.

The Editor.
Pulp and Paper Magazine,
45 St. Alexander St., City.

Dear Sir:—

With reference to conversation we had with you regarding a description of the machinery, etc., in the Bathurst Lumber Company's Plant that appeared in your November 15 issue, would advise that the ten Marx Double Beaters installed in the container Board Mill of the Bathurst Lumber Co. are driven entirely by the Renold Patent Silent Chains supplied by us. The Lava Stone and Steel Rollers of each Beater are respectively operated by individual C. G. E. Motors of 50 and 75 H. P. by Renold Patent Silent Chain Drives 5" and 8" face with distances of 6'2" and 5'10" respectively between the centres of the rolls and the Motor shafts.

It is of further interest to note that the three Kollergangs (with which the chips are treated prior to the stock going to the Beaters) are also driven by 50 H. P. Renold Silent Chain Drives these Drives being practically vertical with centres of 5'9".

From the above it will be seen that in the Bathurst Mill a total of 1,400 H. P. is transmitted by Renold Patent Silent Chains.

We are,
Yours very truly,
JONES & GLASSCO., REG.D.
Per LATCHFIELD.

WAUSAU SULPHATE FIBRE CO.

Announcement is made by Mr. Karl Mathie, President and Manager of the Wausau Sulphate Fibre Company, that Mr. George King Gibson is acting as Sales Manager. This arrangement became effective November 22, 1915.

DIPPERS VERSUS SYPHONS

By JOHN BRASSINGTON.

(Specially written for the Pulp and Paper Magazine)

The law of life, the great underlying motive of existence eternally strives towards the selection of those things that are excellent, and therefore, the best fitted to survive. All institutions, races of men, systems of government and theoretical statements of natural laws are passed through the "mills of the gods" which, although they grind slowly, are pitiless and exact in the process. The balance between competitive systems and methods is sometimes comparatively small, and so it therefore follows that the inferior of any two will often survive, in out of the way corners, to which it has been pushed by its successful rival, or will even maintain a losing fight in more prominent places before it is finally relegated to innocuous desuetude. In time, may be not for generations, but ultimately, all inferior methods and systems disappear; they only hold on to a precarious existence because not subjected by their users to a precise and careful examination.

All mechanical and engineering appliances now in general use are subject to the law of the survival of the fittest, and those not worthy, finally will be relegated to the junk heap, where the old muzzle loader boilers lie athwart the oars of the old galley slaves

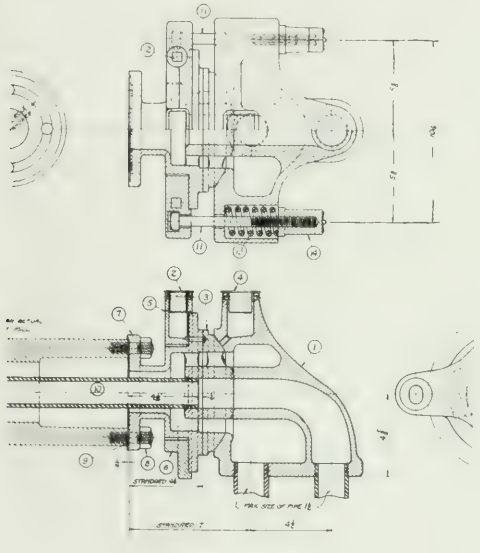
It has been the highly prized privilege of the writer to assist at a long series of experiments, in order to determine, as far as possible, the relative value of Dippers and Syphons, as condensation removers from the interior of paper machine dryers. The preparation for these tests was carefully thought out and every effort was made to reproduce actual drying conditions in such a manner as to give a fair comparison between the two different methods.

Four 46" diameter dryers about 120" face, were used, and the piping was so arranged that the quantity of water evaporated from the canvas on the outside was ascertained by measuring the water before passing over the dryers, and the water that was not evaporated; readings of the temperature of the oncoming and offgoing water were also made, and from this data, the work done by all the dryers and by each drying in thermal units was determined. The quantity of water used per dryer was varied within wide limits, during this series of tests, and possibility of error in

Experimental Plant Showing Soap Cooling Machine.

comparing the relative value of dippers and syphons was practically eliminated by making the methods of collecting and recording test data absolutely identical in all cases.

The quantity of steam used per dryer to do the work in each case was ascertained by the use of a General Electric Steam Meter, checked by measuring readings being simultaneously made. The heat lost by the steam was equated to the heat in the work done, as shown by the exterior water in each case. The dryers were driven at varying peripheral speeds, the steam pressure was varied, the steam to and water of condensation from the dryers was arranged so each dryer had its individual supply and evacuation; the whole nest was operated as a unit. All these different



Dipper Steam Joint.

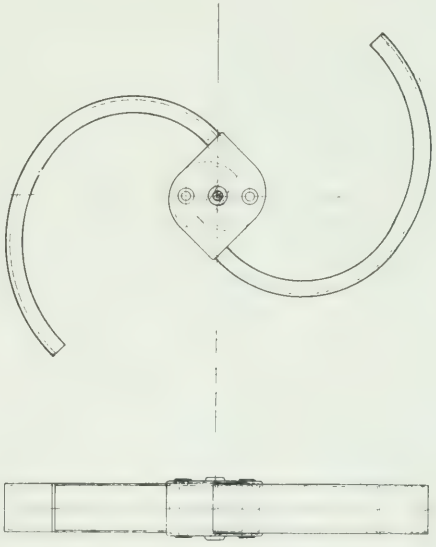
tests were made with air vents and without air vents; different steam joints were used as they represented prevalent and improved practice.

Much valuable information covering kind of steam joints, methods of piping, result of the presence of grease, air and water in the dryers, was naturally collected during this extensive series of tests; this information, however, does not belong under the heading of this writing and for the sake of clearness in explaining the relative value of dippers and syphons, will not be included in it. The following valuable facts with respect to the operation of dippers and syphons are well worthy of record:

(1) Dippers are more uniform in service than syphons, under all and similar conditions; there being clear path for pressure to pass from the steam line through a dryer to the water line, there is a continual effort on the part of the incoming steam to equalize the pressure throughout. If there is enough steam to do the work in the dryer, there is almost as much pressure in the water line as in the dryer, or in the steam header; the result in the case of the syphon is that water collects in the dryer until there is a sufficient head of water established to start the syphonic action; once started, this action is continued until the head of water plies the steam pressure in the dryer, and is about equal to the drop head from the dryer to the water header, plus the pressure in the water header; when this equilibrium is established, the syphonic action ceases until the contrary is the case. Consequently, syphons work by fits and starts. Dippers, depending only on the mechanical action of the moving dryer work continuously and evenly when properly designed.

(2) Dippers, of correct design, work satisfactorily up to 800 ft. per minute and over in 48in. dryers at any steam pressure from atmospheric pressure up. Syphons will not work at low steam pressure and high peripheral speeds; they even require special piping arrangements to work at high steam pressures and high peripheral speeds. Syphons begin to cease to be practical at 500 feet paper speed per minute.

(3) Syphons transmit pressure to the water header as freely as dippers, according to the pressure readings taken in this test, but tend to clog up more readily when there is much grease in the dryer.



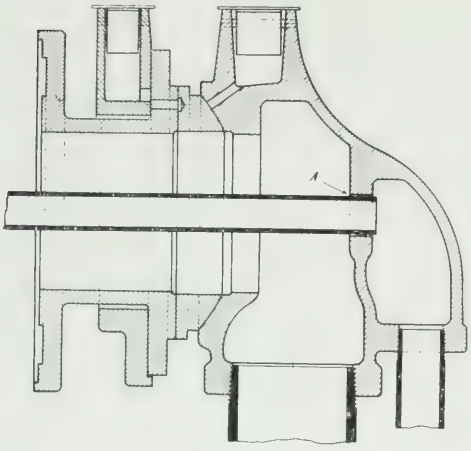
Dipper.

These leading facts are apparently true for dryers with air vents and without air vents, for pressures varying from one pound gauge to twelve pounds gauge. The variation between the pressure of the incoming steam, the pressure in the interior of the dryer and the pressure in the water piping was seldom more than half a pound, and for this reason, an attempt to make the syphons work at 700 ft. paper speed, by increasing the initial steam pressure was quickly rendered abortive by the water line pressure mounting up in proportion. The centrifugal force tending to keep the water on the inside of the shell of dryer being great enough at this high speed to overcome the differences in pressure between the inside of the dryer and the inside of the water header. This centrifugal

action is great enough to overcome the evacuating action of the dipper in a 48 in. dryer when the paper speed is about 800 feet, while in a 60 in. dryer, a paper speed of 1200 ft. a minute may be maintained, and proper dipper action be insured by careful dipper design.

The limit of the syphon action is apparently from about 500 ft. to 600 ft. paper speed, providing proper piping arrangements are made, being much lower with the average paper mill piping practice, syphons begin to lose efficiency at lower speeds than the above.

Temperature readings of the outside of the shell of the dryers were taken periodically throughout all these tests, and within the working limits of the syphon no difference in the comparative efficiency of the dryers with dippers or with syphons was noted. The work done per square foot of drying surface, as shown by the records made of the water evaporated and heated by the shells of the dryers, did not apparently vary for the same conditions whether dippers or syphons were in use. The presence of water in the dryers while in active circulation, did not apparently affect the dryer capacity; the main drawback to the presence of water, as shown by these readings, was only temporary, and then was due to the presence of cold water not properly removed between certain tests; this condition was often present even under most favorable piping arrangements, when syphons were in use, and was only observed to exist when dippers were in use when the piping arrangements were what we may term the "old style," that is, even now too prevalent in the paper mills of the day.



Steam Joint.

The decided indication given by these tests of the superiority of the dippers over the syphons as adjuncts to the dryer nest of a paper machine, caused the writer to search diligently for corroborative evidence from outside sources. Realizing that there is only one dipper now on the American market that is designed expressly for high speed paper machines, and that below these speeds the comparison between the syphon and other inferior types of dippers would probably show in favor of the syphon, he was forced to look for such corroborative evidence to Europe.

It was a great satisfaction, as it always is in such a case, to any experimenter, to find that the results, so laborously obtained during the tests here spoken of, are indubitably confirmed by the practice of the leaders in European paper machine manufacture.

The balanced open type of dipper, the method of piping, the whole system of water evacuation, that was proved the best at these tests, is the same as that adopted as a standard in the best paper machines manufactured in Europe. This means that by process of elimination, together with careful summary of results, the makers of these tests arrived by their own efforts to the same system and conclusions, as those already adopted abroad in compliance with the great natural law of the survival of the fittest. It is a pleasure to state that no effort to copy was the underlying cause of this final selection; it was only made as the logical result of long and careful investigation of the enormous amount of data collected during this interesting series of tests; it was a great satisfaction to find that the result, thus ultimately obtained, is the same as that held up as a standard by other investigators in the old world.

On this side of the Atlantic other investigators have apparently failed, as yet, to reach the above conclusions, but this is probably because the experiments made have not been sufficiently exhaustive to cover the extremes of speed that must now be taken into account to justify a final decision. It is well here to state that work in the field has shown since these tests that the results obtained by them bear the acid test of practice triumphantly. Looking back on the years, it is recognizable that the principles governing this application of practical science, have been applied in part in different places, and have in part failed; such an actual failure, though often a comparative success, has been always attributable to a lack of knowledge of the necessity of providing for all the causes of failure, instead of taking care of some of them too well and neglecting, at the same time, others equally important. Dippers like syphons will fail, if not of proper design, or if improperly installed, and even when of good design and unimpeachably applied, they may fail to give perfect service, if adequate arrangements are not made to take care of the delivery of steam to the dryers, and the taking away from them of the water of condensation, as it is delivered by the dippers to the water header.

It is not the intention of the writer to convey the impression that syphons are not useful in their place, because with certain limits, syphons equal dippers as water eradicators, even when we take into account their fitful service as compared with the continuous operation of a well designed dipper; on a slow speed paper machine, with a constant load, the average transference of heat per square foot of heating surface, per unit of time, is apparently the same for each method.

The following tabulation of part of the data collected on these tests is given as a help to the reader in following the arguments given and the results determined on. A view of the tending side of the dryer installation, taken during one of the tests is considered of sufficient interest to be shown; it is unfortunate that a satisfactory view of the complicated piping on the driving side was not obtained; it is quite a

problem to pipe up a system of dryers so as to make each dryer or any group of dryers independent in its steam and water service, and at the same time, arrange for simultaneous pressure and temperature readings. The illustration shows the dryer temperature control, on the wall, the weir overflows, one being checked by a measure held under it by an operator; the swinging syphon gauge employed to determine the level of water in the interior of the dryers is being used by another engineer. A reducing valve regulated the steam pressure which was reduced from 125 lbs. gauge to the pressure desired, by means of a barrel calorimeter, and an interior water spray in the low pressure steam supply pipe, the moisture in the steam was kept at about the amount that represents usual exhaust steam dryer practice. The importance of knowing the amount of suspended moisture in low pressure steam, when comparative tests of a drying or heating installation, in order to keep tab on the use of heat is evident; this series of tests has shown us how often even the most careful of engineers may miss an essential point. For instance, a water suspension in the exhaust of a paper machine engine of over 15 per cent of the total weight of the steam is common, and yet this quantity may vary between wide limits in different cases; and even in the same case, from hour to hour, where there are globe valves with their stems vertical, many fittings, separators or traps between the engine and the paper machine, together with a variable load on the engine.

It is evident that tests made of such an installation that have their results on the weighing or measuring of the condensate only are liable to large errors, and cannot be depended on; a saving or a loss of thousands of dollars a year may be claimed on the basis of a test of this sort, and yet be at variance with actual fact. The influence of the temperature and humidity of the outside air, together with the quantity of the supply, have a large control of the efficiency of a paper drying apparatus, not only in the resulting quality of the paper, but also on the economy of the operation. Too much air will cause excessive radiation losses; too little will retard drying effect, and the quantity of air that will give the best results varies with both the temperature and humidity of the air supply.

The accompanying illustrations show the styles of syphons and dipper, and also some of the steam points used. The number of natural laws that govern a test or a series of tests of this description is so great, their combinations so varied in effect, that only the utmost care can guard against error; the more conscious the testing engineer is of these facts, the more careful he is in guarding the integrity of his investigations, and also the more fearful of error and distrustful of results. It is only the neophyte who claim an errorless result, and promulgates a law on insufficient evidence; in the case of the tests here partially described, it is felt that the reliability of the results is, humanly speaking, worth trusting, while the concordance of the conclusions, with the effects aimed at by dryer piping arrangements endorsed by the most up-to-date European practice, lends added value to the verdict the evidence of these tests forces on an investigator's mind.

It follows from these conclusions, that some day, as the truth spreads, that syphons will never be placed in the dryers of high speed paper machines, for as intimated at the beginning of this article:—

"The Mills of the Gods grind slowly, but they grind exceedingly small; with patience, he stands waiting, with precision, grinds he all."

No. and Description	No. of Dryer	Pounds of Steam Condensed	Temp. F. Outside Shell of Dryers	Pressure lbs. Gauge Steam Header	Pressure lbs. Gauge Inside Dryers	Pressure lbs. Guage Water Header	Lbs. Water in Dryers End of Test	Lbs. Water Sprayed on Outside	General Data	
(1)—Syphons:										
	1		173	3.90	2.20	2.60	804	1000	Surface	
	2	3731	173	3.90	2.80	2.80	386	750	Speed	585'
	3		173	3.90	3.00	2.50	272	375	Humidity	85%
	4		172	3.90	2.70	2.30	103	240	Temp.	88F.
(4)—Syphons:										
	1		170	3.25	3.50	3.60	1280	1000	Surface	
	2	3730	179	3.50	3.70	3.70	545	750	Speed	525'
	3		187	3.60	3.80	3.60	272	375	Humidity	96%
	4		185	3.75	3.50	3.30	120	240	Temp.	88F.
(9)—Dippers:										
	1	826	165	3.25	3.25	3.12	22	1000	Surface	
	2	528	185	3.00	3.25	3.25	9	750	Speed	525'
	3	280	210	3.00	3.25	3.25	55	375	Humidity	96%
	4	725	225	3.00	3.25	3.25	46	240	Temp.	90F.
(10)—Dippers:										
	1	552	185	3.20	3.20	3.20	92	1000	Surface	
	2	612	210	3.50	3.70	3.20	36	750	Speed	525'
	3	223	210	3.80	3.80	3.80	23	375	Humidity	88%
	4	620	220	3.60	3.60	3.60	44	240	Temp.	92F.

CANADA'S EXPORT OF NEWS.

Canada is doing an increasingly large trade in newsprint and pulp wood. During the month of August Canada exported $1,564,510 worth of newsprint, which is a new high mark for a single month's business.

The bigger business with the United States, which of course is Canada's best pulp and paper customer, reached the proportions of $1,320,504 during August. For the five months of the Dominion's fiscal year newsprint exports to the United States alone aggregated $5,909,618, comparing with $4,630,597 in the same period a year ago.

The export trade in newsprint for the five months reached a grand total of $6,663,289, compared wtih $5,321,419 a year ago. The amount of business contrasts with eight months' trade in 1913, totalling $6,-918,177, and eight months in 1912 of $3,110,458.

England is becoming a bigger buyer of our newsprint. A year ago England imported only $7,646 worth of the Canadan product; this year $28,582. The Colonies are maintaining their previous business.

The business which has been done so far this year in chemical and mechanical pulp export cannot be compared with last year. The larger figures of export are due to the strike conditions which have existed in Northern New York pulp and paper mills.

The following table shows the exportation of newsprint paper for the current fiscal year, and since April, 1913. The figures for March do not count, owing to the practice of the Government of including in that month shipments made during that month, but not reported until the next month, which during the rest of the year are credited to the month in which they are reported.

Month, 1913.	Chemical pulp.	Mechanical pulp.	Newsprint.
April	$202,110	$143,126	$596,554
May	201,276	234,494	810,575
June	121,199	173,445	874,284
July	218,302	251,284	793,898
August	203,542	276,171	889,645
September	232,835	399,057	941,986
October	233,159	467,878	976,028
November	273,278	357,688	1,037,207
December	311,251	450,030	1,057,817
1915.			
January	257,194	265,750	928,223
February	254,250	174,522	1,048,778
March	414,687	259,296	1,432,850
April	258,497	164,494	836,110
May	386,909	189,792	1,092,172
June	347,606	270,990	1,135,283
July	358,170	604,869	1,149,569
August	382,225	164,942	1,108,285
September	489,741	566,217	1,247,780
October	484,575	935,226	1,405,431
November	321,128	455,280	1,064,634
December	428,164	457,833	1,361,155
1915.			
January	393,778	239,758	1,085,019
February	358,983	263,948	1,082,032
March (not reported yet)			
April	355,843	120,437	970,445
May	406,568	146,844	1,341,243
June	429,489	131,982	1,345,444
July	442,976	468,385	1,441,647
August	551,693	157,614	1,564,510
Five months new fiscal year	2,186,569	1,025,260	6,663,289

QUEBEC'S VALUABLE FORESTS.

Quebec's forest areas total 130,000,000 acres as compared with a high mark of 100,000,000 for any other province of the Dominion. The annual return from forest products is nearly one-third of that of the whole Dominion. An estimate of the forest wealth within the borders of the province has been made as follows: White and red pine $200,000,000, spruce and balsam fir $250,000,000 pulp wood $100,000,000, hard wood $2,000,000—a total of $600,000,000. Quebec's lumber production for the year 1913 was $630,346,000 feet B. M., with a value of $10,618,000; production of shingles in that year amounted to 363,560,000, with a valuation of $659,000; production of lath for the same period was 90,231,000 with a value of $225,000. The importance of the pulp-wood industry is to be found in the fact that in 1914, 23 of the 49 Canadian mills were in the province, and the production consumed amounted to 636,496 cords, which is just about 50 per cent of the total consumed in Canada; the valuation was $4,148,-000. In addition to this there were exported in that year 687,421 cords, being nearly 75 per cent of the whole Canadian export, and representing $4 734,494. making a total value of $8,882,899. In addition there were poles, cross-ties and other products of great value.

LAURENTIDE POWER CO.

J. E. Aldred, president of the Shawinigan Water & Power Co. and Cedars Rapids Power, has been chosen president of Laurentide Power Co., and F. A. Sabbaton, vice-president. The other members of the board are: Edwin Hanson, C. R. Hosmer, George Chahoon, jr., J. H. A. Acer, Howard Murray, Julian C. Smith, and secretary-treasurer, W. F. Robinson. One vacancy on the board remains unfilled, and it is held for a representative to be named by the Shawinigan Water & Power Co.

That is the original Laurentide group will have five and the original Shawinigan group four representatives on the board.

PULP MAN GOING OVERSEAS.

It has been announced that Sidney Downer formerly Manager and Secretary of the Macleod Pulp Company, Limited, has recently resigned his position and has volunteered for Overseas Service. Mr. Downer hopes to be able to go across with one of the Pioneer Battalions now being organized in Nova Scotia.

TENDERS TOO LOW.

So far as inquiry goes, it does not appear that the tenders offered for the Lac Seul pulp limit in Northern Ontario have been considered acceptable by the Lands and Forests Department, and it is regarded as probable that the matter will be held up and fresh tenders asked for when times are more favorable.

FIRE AT THOROLD MILL.

Fire did considerable damage to the Ontario Paper Mill at Thorold a few days ago. Coal in the storage bin for the self-feeding boilers became ignited, and at one time the blaze assumed such proportions that the whole building was threatened. The damage amounted to $2,000, covered by insurance.

BATHURST LUMBER COMPANY SECURES ADDITIONAL FUNDS

The Bathurst Lumber Company, Limited, are issuing, through Messrs. Callaway, Fish & Company, of New York City, $1,000,000, First Mortgage Five Year 6 per cent Convertible Gold Bonds of this Company.

The Miners Bank of Wilkes Barre, Wilkes Barre, Pa., are Trustee.

This makes a total capitalization of the Company at the present time as follows:—

Authorized.	Issued.
$5,000,000 common stock	$3,036,150
$1,000,000 First Mortgage 6 per cent convertible gold bonds (when issued)	$1,000,000

The Company was incorporated under the laws of the Dominion of Canada in 1907 with an authorized capital of $100,000, and acquired the lumbering property of F. W. Sumner at Bathurst, N.B., consisting of a saw mill, warehouses, dwellings, etc., at Bathurst, 400 square miles of licensed timber lands tributary thereto, and his lumbering outfit.

History.

In 1911, the Company acquired an adjoining saw mill and lumbering plant with 500 square miles of licensed timber lands. At this time the capital of the Company was increased to $1,000,000; the original stockholders of the company taking stock for their investment which represented the cash actually paid in (about $290,000) plus the accumulated earnings ($60,000). The balance of the capital stock ($650,000) was sold at par for cash. The company also at this time acquired about 150 square miles of additional licensed timber lands, making a total of 1,050 square miles, or practically all of the timber lands in the Bathurst watershed. It also acquired by purchase for $75,000 cash, the water power rights at Grand Falls, on the Nepisiguit River, the second largest in the Province of New Brunswick, affording a development of about 10,000 horse power.

Early in 1914 it was decided to build a new pulp and container board mill, and to buy the timber limits of Edwards & McLean, at Bonaventure, Que., which lies directly across the Baie de Chaleur, in the Province of Quebec. This is a virgin limit of 500 square miles, and is considered the finest timber limit in Eastern Canada.

The Edwards & McLean interests took $1,000,000 of common stock of the Bathurst Lumber Company, Limited, in exchange for this (which is practically what the limit cost them). At this time the earned surplus of the company was distributed to the stockholders through a 50 per cent stock dividend. In addition to this $536,150 of new stock of the company has been sold at par for cash, making the outstanding capital stock of the Bathurst Lumber Company, Limited, $3,036,150.

The company does a general lumber and pulp business. Its properties are located in the Provinces of New Brunswick and Quebec, and consist of timber rights on 1,550 square miles (1,000,000 acres), on which it is estimated there are 1,884,000,000 feet of saw timber and 11,136,000 cords of pulp wood. This timber has an estimated standing value of over $5,000,000. Practically all of the territory is well covered with a growth of spruce and balsam, intermixed in places with white pine, cedar, white and yellow birch and poplar.

The company also owns 10,000 acres of additional lands in fee, and owns and operates three saw mills, with a total annual capacity of 60,000,000 feet, and an electrically driven planing mill with an annual capacity of 25,000,000 feet, also a pulp and container board mill with an annual capacity of 30,000 tons. In addition, there are 60 acres of lumber storage yards, 2,500 feet frontage of shipping wharves, railroad siding, stores, office buildings, dwellings, warehouses and valuable water power rights at Grand Falls. The total value of the above property, exclusive of timber, is in excess of $2,000,000.

The present worth of saw logs and manufactured lumber, cash, notes and accounts receivable, stock of goods, and supplies in its general store and warehouses is equal to $1,250,000.

Market.

A market has been found for all the company's lumber products in Great Britain, France, Italy, West Indies, South America, Africa, Eastern Canada and the Eastern part of the United States.

The market for the pulp and container board is being developed in Eastern Canada and the Eastern United States, the demand for both of which is constantly increasing.

Security.

This issue of $1,000,000 First Mortgage 6 per cent convertible Gold Bonds is to be secured by an absolute first lien on the property of the company, including all the licenses and government grants, and any real property that the company may acquire in the future during the life of these bonds.

Convertibility.

The bonds may be converted into the stock of the company par for par on any interest date at the option of the holder. In addition to the large surplus which the company has already earned, dividends at the rate of 6 per cent per annum have been paid on the company's outstanding stock since 1911.

Earnings.

The net earnings of the company have shown a healthy and steady increase in proportion to the increased capital and production, and the net earnings after all charges were as follows:

		Mill cut.
1909-10	—$52,237.67	15,400,000 ft.
1911	—$48,477.92	18,200,000 ft.
1912	—130,038.32	31,700,000 ft.
1913	—154,806.77	26,700,000 ft.
1914	—157,098.67	39,700,000 ft.

The pulp mill, which has been completed within the past two months, is operating satisfactorily and developing a production that has exceeded the estimated output of the engineers. The container board mill is nearing completion, and it is expected that it will be operating before the beginning of the coming year.

The officers of the company are: President, Hon. Wm. C. Edwards, Ottawa, Ont.; Vice-President, Mr. Angus McLean, Bathurst, N.B.; Treasurer, Mr. Albert Loosen, Bathurst, N.B.; Secretary, Mr. M. E. Preisch, North Tonawanda, N.Y.

The Directors are:—Hon. Wm. C. Edwards, Ottawa, Ont.; Mr. F. M. Kirby, Wilkes Barre, Pa.; Mr. Wm.

H. Crosby, Buffalo, N.Y.; Mr. F. L. Peck, Scranton, Pa.; Mr. C. M. Carrier, Punta Gorda, Flo.; Mr. Angus McLean, Bathurst, N.B.; Mr. Cyrus D. Jones, Scranton, Pa.; Mr. Hugh McLean, Buffalo, N.Y.; Mr. E. S. Peck, Scranton, Pa.; Mr. M. E. Priesch, North Tonowanda, N. Y.

LUMBER MANUFACTURING ACCOUNTS.

A recent publication by the Ronald Press Company, of 20 Vesey street, New York, is entitled "Lumber Manufacturing Accounts," by Arthur F. Jones, of the staff of Marwick, Mitchell, Peat & Co., certified public accountants; associate of the Institute of Chartered Accountants.

The book contains ten graphic chapters, segregated for the purpose of describing tersely and concisely each department of the accounting, the whole representing a complete system.

This is the fourth volume of the Ronald accounting series.

CAPE BRETON PULP COMPANY RE-BUILDING.

According to despatches from Sydney, C.B., the construction of the Cape Breton Pulp company's plant at St. Ann's, which is to work the large timber limits in that vicinity has made splendid progress and the barking mill, which has been under construction since September is now nearing completion.

The company, which is controlled by American capital, plans to work the timber from about fifty acres per day.

TO MAKE VEGETABLE PARCHMENT IN CANADA.

A new Company is just completing arrangements to manufacture genuine vegetable parchment paper in Canada. The new Company will be known as The Canadian Vegetable Parchment Co., Limited, and mills will be located at St. Catharines, Ont. The company will have quite a large capital, and will also make Paper Specialties. This company will be the first to manufacture this line of paper in Canada, which has hitherto been imported from the European countries and the United States.

FORESTRY MEN ENLIST.

Thirty-five per cent of forestry graduates and undergraduates have enlisted. A professor in the faculty of forestry at the University of Toronto has estimated that about sixty-two graduates are engaged in forestry or allied professions, and out of these twenty enlisted up to October 20. Out of seventy-one graduates twenty-seven have enlisted.

TRADE OPENING IN SOUTH AFRICA.

A firm of paper merchants in Cape Town who have for years held continental news print agencies, are prepared to handle a Canadian agency for South Africa and request correspondence from manufacturers who are able to guarantee regular supply.

TO REBUILD MILLERTON MILL.

Mr. John Bower, of Montreal, formerly sales manager of the New Brunswick Pulp and Paper Company, states that the mill destroyed by fire at Millerton will be rebuilt by an Anglo-American concern, with Sir Robert Perks as the main stockholder. The mill when rebuilt will be much larger.

Ottawa Notes

Ottawa, Ont., November 25.—Ottawa lumbermen and pulp and paper operators have during the past week been playing a prominent part in Canadian activities in connection with the present war—and doing it in two ways. They have, first of all, been to the fore as recruiting agencies for local regiments, and secondly as subscribers to Canada's new war loan of $50,000,000.

The 77th Regiment of Ottawa, in common with other recruiting units which have been recruiting in this city, have, during the past two weeks, been conducting a recruiting campaign here. In this they have received material assistance from local paper manufacturers. Mr. J. R. Booth has pledged himself to raise a platoon of fifty men from his mills, while the E. B. Eddy Company has made a similar offer, and will also raise sections of twelve men each.

As regards the war loan, Mr. Booth, Mr. E. C. Whitney and Sir Henry Egan, all three being connected prominently with the lumber or pulp and paper trade, have subscribed various sums, not announced, but understood to be in the neighborhood of $100,000 each.

Advance figures have been issued by the Trade and Commerce Department for the period ending August 31, 1915, indicating how Canadian trade during that period compared with the previous one. They are of especial interest since they cover a year of war. They indicate a healthy condition in the pulp and paper trade, inasmuch as though imports of pulp and paper into this country decreased by almost half, exports increased over twenty per cent. The total imports of paper and its manufactures were $4,627,756, as compared with $7,281,748 for the same period the previous year, and $3,438,853 representing the import from the United States. On the other hand exports increased from $14,085,080 in 1914 to $17,043,096, some $14,279,954 or more than the whole export for the previous year, going to the United States alone. This was the export of paper and its manufactures, while as regards wood pulp the figures also showed an increase, $9,367,467 being exported as compared with $7,461,398. Pulp wood exported was valued at $6,415,033, or a little less than the previous period, when the value was $6,809,923.

The Supreme Court last week deliberated on a case in which some 10,000 cords of pulpwood were at issue, judgment being reserved. The case was that of Martineau vs. Stewart and the Bank of Nova Scotia, in which Mrs. Martineau sued Stewart for the cutting of the pulpwood on timber limits leased by her from the Seminary of Quebec on the Huron River. She also claimed an accounting of profits under an alleged partnership with the defendants, which gave her one-third of the profits. She seized the pulpwod, but as it had meanwhile been transferred to the Bank of Nova Scotia for advances the bank intervened. The lower courts dismissed Mrs. Martineau's action, maintained the bank's intervention, and held that no partnership had been proved. Mac.

TO OPEN LABORATORIES.

The Forestry Branch of the Department of the Interior and McGill University have issued invitations for the opening of the Forest Products Laboratories of Canada, 700 University street, on Friday, Dec. 3, at noon. A luncheon will follow at the Mount Royal Club at 1.30.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Hercules Paper Bag Co., of Reading, Pa., suffered a fire loss at its plant of about $50,000, during the past fortnight.

* * *

George R. Botch, of Jersey City, N.J., has been appointed receiver for the Jersey City Paper Co., which recently filed a petition showing $113,534 in assets, and $167,826 in liabilities.

* * *

Reports from Philadelphia, Pa., state that the Economic Power and Products Co. will begin operations in the near future at Greenwood, Miss. This company, which was organized about eighteen months ago, will manufacture pulp from cotton stalks.

* * *

The International Paper Co. of New York City, has leased new branch quarters at Chicago. Space in the Conway building Clarke and Washington Streets, is being fitted up, and it is expected to be ready for occupancy by January 1, 1916.

* * *

The Mead Pulp and Paper Co. has just filed papers with the Secretary of the State of Ohio authorizing the issue of $450,000 special preferred 7 per cent stock, payable quarterly, to follow the present $350,000 outstanding 6 per cent preferred stock, and $150,000 common to be added to the present $500,000 common stock.

* * *

Judge Ray, of Auburn, N.Y., has confirmed the sale of the sulphite mill of the Battle Island Paper Co., at Fulton, N.Y. The sale took place at the Court House in Oswego, on November 4, under the direction of the trustees in bankruptcy, S. G. Daley, who represented the bondholders of the defunct company, bid in the property for $27,000.

* * *

Treasurer J. F. Ryan, of the Liberty Paper Co., Milton, Man., has filed the following annual financial report of his company with the Secretary of State: Real estate, $20,000; machinery, $8,049; cash and discounts received, $23,624; manufactures and merchandise, $9,928; furniture and fixtures, $1,226; good will, $4,000; profit and loss, $3,345; total, $70,172. Capital, $38,000;; accounts payable, $26,172; subscriptions on stock, $6,000; total, 70,172.

* * *

The United Paper Board Co. of New York City, held its annual meeting at Jersey City, N.J., during the past fortnight, and the following officers were elected for the ensuing year: Sidney Mitchell, president; Matthias Plum, Jr., vice-president; W. C. Staley, vice-president; Frederick Davenport, vice-president; L. W. Bodman, secretary; and Gustav Wuert, treasurer. The entire directorate was also re-elected. It consists of Charles C. Adsit, L. W. Bodman, H. L. Bodman, L. B. Boyd, Frederick Davenport, Sidney Mitchell, Leeds Mitchel, George J. Maroth, M. Plum, Jr., S. B. Sutphin, James Todd and W. C. Staley.

The one hundred and twenty-fourth meeting of the Boston Paper Trade Association was held in that city on Wednesday evening, Nov. 17, at the Exchange Club.

* * *

On Friday afternoon, November 26, the stockholders of the Riverview Coated Paper Co. held a meeting at Kalamazoo, Mich., to discuss the advisability of erecting a new mill.

* * *

Reports from the Adirondack forest indicate that the cut of Christmas Trees this year will be larger than ever before. It is estimated that over a million little trees will be shipped to the nearby cities within the next fortnight.

* * *

The P. A. Sory Paper Co. of Middletown, O., is preparing to erect an addition to its plant, which will involve an expenditure of about $10,000. The building will be used for the bleaching department.

* * *

A severe wind storm visited Watertown N.Y., during the past fortnight, and did considerable damage to the several paper mills there. The Cylinder Paper Co. reports that the wind blew the roof off of its grinder room. The roof fell over on the side of the building, and several of the employes were slightly injured. Pending repairs, it was necessary to close the mill for several days. * * *

The annual meeting of the American Forestry Association will be held at Boston, Mass., January 17 and 18, 1916. Secretary Ridsdale states that the convention will convene at the Copley-Plaza Hotel. Some of the subjects already scheduled to be discussed are: "New England Forest Problems," "Municipal Forests," "National Forest," "Chief Forester, Henry S. Graves; "State Forest Organization and Problems," "State Fire Protection Work", and "City Forestry and its Future." As usual, the sessions will conclude with the annual banquet.

* * *

C. W. Bell, treasurer of the Norwich Paper Mills, Inc., Norwich, Conn., has addressed a letter to the creditors of the company, in which he says in part: "By proceedings in the Superior Court of Conn., A. S. Comstock has been made temporary receiver. Our difficulties are due to insufficient working capital, together with other contributing causes. Our liabilities are $70,000, of which $50,000 is secured by mortgage to our predecessors, The A. H. Hubbard Company. Our assets at inventory value are $127,500. I feel sure that within a reasonable time we will be able to pay every creditor in full. I have in hand negotiations for the sale of the assets of the Corporation, its mill and business as a going concern, which should be brought to a definite conclusion within sixty days, and possibly within thirty days, and these negotiations are on a basis that will enable us to pay all obligations of the company."

PULP AND PAPER NEWS

Judgment has been given by the courts in favor of Dan A. Rose, in his action against George M. Rose and the controlling interest in the Hunter, Rose Co., printers, Toronto, now held by the estate of the late G. M. Rose, which is ordered to be sold.

It is understood that the Ontario Department of Lands, Forests and Mines, will not accept any of the bids for the English River pulp limit in Northern Ontario and that new tenders will be called for when conditions are more favorable.

W. E. Smallfield, of Renfrew, Ont., President of the Canadian Press Association, and E. Roy Savles, of Port Elgin, Ont., who is chairman of the weekly section of the Association, have returned from an extended trip throughout the Western Provinces. A proposition was put before a number of Western publishers of raising the annual subscription for weekly newspapers to one dollar and fifty cents. A resolution was unanimously carried favoring such a move, in the interest of both press and people, and tending to a freer press. Several district conventions were held at which similar resolutions were passed. A Provincial Press Association was formed in Saskatchewan, and henceforth Manitoba and Saskatchewan will be distinct divisions, which will the better facilitate dealing with provincial problems.

Frank W. Hinsdale the American expert, who, for the past year and half, has been engaged in the work of organizing and systematizing the Workmen's Compensation Act in Ontario, was tendered a farewell banquet by the staff and members of the Compensation Board recently, previous to his departure across the line. He was presented with a handsome set of pipes in a leather case. Mr Hinsdale voiced his pleasure at having had a part in the organization of the present act, which has now been in operation eleven months. He said that the measure, which Ontario had adopted was, in his opinion superior to any of the laws with which he was familiar in the United States.

The New York and Pennsylvania Co., a corporation created under the authority of the laws of Pennsylvania, has taken out a license in Ontario to carry on the business of manufacturing paper and wood pulp, and is empowered to expend the sum of two hundred thousand dollars for such purposes, in the province.

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines for Ontario, has been gazetted an Honorary Colonel of the Canadian Militia. Many friends has been appointed Secretary of the Department of are congratulating him on his new distinction .

H. D. Hart, managing director of the British American Wax Paper Co., Toronto, is on a business trip to England.

C. C. Hele, Secretary to Hon. G. Howard Ferguson, Lands, Forests and Mines for Ontario, in place of the late E. S. Williamson, who passed away a few days ago. Mr. Hele will discharge the duties of both secretary to the Minister and to the Department.

John Dennemy, who was one of the mainstays of the Cornwall Lacrosse Club last summer, and a very promising player, met with a serious accident in the mill of the Toronto Paper Manufacturing Company last week. He was working on a playter when his fingers were caught by the machine, and the next time his left arm was drawn in and badly mangled. It was found necessary to amputate the arm just below the elbow. Dennemy is only sixteen years of age.

The new electrical unit at Eugenia Falls, Ont., has been put in operation by the Ontario Hydro-Electric Commission at a cost of $600,00, and the supply of energy for the province has been augmented by 4,000 horse-power. The new power house was formally opened last week, and, by enlarging it, the Commission can get 8,000 horse power at any time. Sir Adam Beck, Hon. I. B. Lucas and W. K. McNaught, members of the Commission, and representatives of many municipalities, were in attendance. The Eugenia Falls branch of the Hydro-Electric Commission activities is a triumph of modern engineering wizardry. The Commission purchased an area of about 2,300 acres, diverted the Beaver river from above the picturesque falls, which now are unwatered rocks, constructed a reinforced concrete dam 2,500 feet wide, and 50 feet high, to utilize a flooded district of 1,800 acres, and ran the water by an open canal to a second dam with a basin or reservoir of 20 acres. A gatehouse was installed at dam No. 2 and a wooden pipe, 3,000 feet long, carries the flow of water to the top of the hill, crowned by a surge tank, and then a steel pipe makes the descent to the power house. After a detour the Beaver river is united with the Boyne below the power house.

At a meeting of the Ontario Pulp and Paper Makers' Safety Association held in Toronto last week, the matter of appointing a Safety Engineer was considered. All protective and safety devices in connection with the operation of the Workmen's Compensation Act, so far as pulp and paper plants are concerned, will be supervised by the engineer. Several applications were presented, and H. D. Scully, secretary, will look into the respective qualifications of those desiring the position. It is expeeetd that a selection will be made at an early date.

Major Joseph Kilgour, of Kilgour Bros., Toronto, who is President of the Canada Paper Co., has returned from New York, where he took his horses for the great show at Madison Square Gardens. His splendid animals carried off twenty-one blue ribbons, a silver cup and a silver salver.

The Markets

CANADIAN MARKETS

The market for newsprint continues active, and all the plants are running to capacity. If the present demand keeps up, and the exports continue to grow at the rate they have for the past few months, it will not be surprising to witness mills asking stiffer prices. At present the market is very firm, and the outlook good. That the favorable reports are founded on fact is shown by the export figures, a new high water mark being touched in newsprint.

The returns from the customs department show that, for the month of August, a total of $1,564,510 was reached, of which the United States bought $1,320,504, while shipments to Great Britain and the Colonies evidenced a healthy gain. For the first five months of the present fiscal year Canada has exported $6,663,289. The United States during April, May, June, July and August purchased $5,909,618, as compared with $4,630,597 in the same time a year ago. It was in November, 1913, that the export of newsprint from the Dominion first touched the million mark, and that this has been increased over fifty per cent in two years bears strong testimony to the high place enjoyed by the output of Canadian plants in the markets of the world.

In sulphite pulp the exports for August last represented $551,693, and for the first five months of the present fiscal year the total is $2,186,569. In ground wood there is no improvement, and the returns for the five months in export stand at $1,025,260. The sulphite market continues to stiffen in price, and the outlook daily grows more uncertain. The condition of affairs is no figment of the imagination, and consumers realize that owing to the imports and the high figures prevailing abroad, quotations may reach an altitude hitherto unknown in Canada. Some mills are now asking as high as $46 and $47 at the mills for immediate delivery, and do not care to make contracts at any stated sum. Inquiries are increasing all the time. The situation in Scandinavia holds out little hope for relief, and it is reported that the mills there are well sold up for next year. It is predicted that sulphite pulp may reach $60 by January next.

Many employes of the mills in Norway and Sweden have gone to Germany to work at higher wages and, even should the war end within a reasonable time, it is not likely that they will return to their former jobs at the old schedule. Dock quantities are gradually lessening, and there is now only a few weeks' supply on hand. The market for sulphite is becoming more and more a sellers' one. In bleached sulphite the figure is also soaring, as high as $65 and even $70 being asked. Bleaching powder has gone up enormously, and other supplies as well.

The ground wood market will, it is expected, continue to improve, as several New York plants have been compelled to close down their grinding machines and will come into the market for supplies. Prices are firmer than they have been for some time, and inquiries are more numerous.

In the book, writing, bond, ledger, and lithographing arena, business has picked up considerably, orders are more plentiful, and not so spotty, while some plants are operating to capacity. Owing to the advances in raw materials, there is some talk heard of another augmentation in prices as manufacturers feel that they cannot go on absorbing the added outlays. In the coated paper line plants are well employed, and although costs have ascended in the matter of case in sizing, china clay, dyes, etc., there is no evidence yet that values will strengthen.

The color situation grows daily more distressing, and, owing to the general scarcity, the production of guaranteed shades in paper is in many instances practically impossible. Notices are being sent to customers that while every effort is being made to overcome the present predicament, there is likely to be variation in shades, due to the changing of the formulas to produce certain colors.

Wrapping paper plants are busier than they have been for many months, and kraft mills are full up, with prices stiffening all the while, owing to the advance in sulphite pulp, which has jumped four to five dollars a ton. Toilet and tissue industries were never as busy as they are at present, and, on colored tissues, there has been an advance from half a cent to a cent and a half, where deep shades are required. On general lines the quotations have been strengthened by about a quarter of a cent, while toilet paper in some ranges has gone up five per cent.

Light wrapping are in strong requisition. The reason for the betterment of the market in the Dominion is that in toilets, tissue and other specialties, owing to the extra duty of seven and a half per cent, United States plants have not been able to capture the Canadian market to the same extent that the mills did under the old tariff arrangement.

Paper bags are moving freely, while the discount has been reduced to fifty and ten on kraft bags, and sixty and ten on manila bags. Jobbers are doing a splendid business in all lines, and report that trade was never better than it has been during the present month. It reminds them of the old days of 1912 and 1913, when everything was at top notch. Collections are improving, and everything has taken on a better tone of late. There is practically an absence of price cutting, and the holiday business is unusually good.

In the rag and paper stock world the prospects are decidedly bright, orders are numerous at higher prices, and the market is rising in all branches. Book stock is very firm, and so is roofing stock, while mixed papers, over tissues and folded news have all taken a flight of two to five cents in the last few days.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.90 to $1.95 at mill, in carload lots.
News (sheets), $1.95 to $2.10 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.

Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 6½c to 7½c.
Writings, 4½c up.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.25.
Manila, No. 1, $3.25 to 3.75.
Manila, No. 2, $3.00 to $3.50.
Unglazed Kraft, $4.00 to $5.00.
Glazed Kraft, $4.25 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $16.
Ground wood $19 to $23, delivered.
Sulphite (unbleached), $45 to $49, del. in Canada.
Sulphite ((unbleached), $46 to $50, delivered in U.S.
Sulphite (bleached) delivered, $62 to $70.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, $1.00.
No. 2 book stock, 60c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.05.
No. 1 print Manilas, 75c.
Folded News, 45c.
Over issues, 50c.
No. 1 cleaned mixed paper, 37c.
Old white cotton, $2.40.
No. 1 white shirt cuttings, $5.25.
Black overall cuttings, $1.60.
Thirds, blues, $1.60.
Black linings, $1.60.
New light flannelettes, $3.75.
Ordinary satinets, $1.70.
Flock, $1.80.
Tailor rags, $1.70.
Blue overall cuttings, $3.75.
Manila rope, $2.65.
No. 1 burlap bagging, $1.35.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45. to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKET.

Special to Pulp and Paper Magazine.

New York, Nov. 25, 1915.

No real hope has been held out for ground wood during the past two weeks. This market has suffered an unusually poor season and does not seem to be tending much to better itself. Reports from most of the news mills show that they are practically all well supplied with ground wood and have sufficient in stock to tide them over for some time to come. Water conditions in most parts of the country continue to be satisfactory and mills having grinding machines have been able to keep them in continuous operation. There is still considerable inquiry from abroad for this pulp, but it appears that comparatively few concerns have been able to profit by this, owing to the difficulty in securing ships for transportation. It is understood in this section that the Canadian grinders are sending considerable stock to Europe. Prices here are poor and weak. While the market is trying to maintain about $16.00 a ton, delivered, much lower quotations have been reported.

Little is new in the markets for chemical pulps. The hardening process, through which it is now passing, becomes more severe continually and the prospects become more indefinite and more precarious constantly. It has now reached the stage where even those who have "covered" themselves by contracts are beginning to wonder whether or not they will actually receive delivery on them. The cost of manufacture has gone up so very much within the last few months that it is problematical as to whether some of the mills will undertake to produce pulp and sell it for the old prices which are now actually, in some cases, less than the cost to manufacture. Some of the importers in this city state that they have definite knowledge that in Scandinavia, the banks have considerable interests in the mills and that, while they have not yet looked into the way things were progressing, it is very likely they will do so soon. Already mention has been made of a few mills which were taken in hand by banks. These banks, finding that the mills were operating on old contracts at prices out of proportion to the cost of manufacture, cancelled the old contracts. At present, it is simply impossible to contract for shipments for the current year or even for the early part of next year. The mills abroad are running at a capacity much

below normal—several have already been compelled to shut down because of the prevailing conditions. For this production, they have an unusually large market. All of the territory which was formerly supplied by Germany is now looking to Scandinavia. Even Germany herself is in the market. The fact is that Germany is considered the largest bidder for pulp, just now. Some believe that it was the Germans who brought so much pressure to bear on the market. With these countries abroad paying prices higher than even those which are being quoted here, it is not likely that any pulp will come into the United States from Norway and Sweden, during the winter, unless on old contract. Imports have decreased greatly—all that comes over now goes right into immediate consumption. Bleached sulphite is in great demand— those who are seeking it are willing to pay almost any price. This market, however, appears to be almost exhausted. Bleaching powder has been sold out for the present year and for the early part of the next and it is actually impossible to obtain spot shipments, in more than limited quantities and then abnormally high prices are being asked. This has necessitated that those mills who did not have much of a supply on hand, must curtail their production. In all cases the price of bleached sulphite has gone up. At present, quotations as high as 4.25c. have been reported and there is every likelihood that the boom will continue until it reaches 6c. Easy bleaching has sprung into unusual demand because of the scarcity of bleached sulphite. Consequently the prices for easy bleaching have gone up. There is little of this stock to be had. Krafts are in good demand and advancing. This commodity seems also to present a great problem to the mills. One paper mill has reported being shut down because of inability to get kraft pulp. It is said in this city that much of the Canadian kraft is going to England.

Rags are advancing spectacularly. Possibly never before has there been such activity or such a future for this market. There is a limited supply of stock in this country—so much so that dealers find it difficult to get much with which to do business. Roofing stock, which was the first grade to jump and which was the original cause for the tendency of the market, is still in great demand. The roofing mills are very busy. It seems that the export trade has increased to such proportions that it will keep the mills operating over the winter which is their usual dull season. This means that the demand for rags will continue right through December and January which is ordinarily the time for the market to experience a slump. Such being the case, it is expected that the high prices may be maintained and kept till the Spring when conditions are anticipated to be such that they may continue. So great is the demand for roofing stock that it has been consuming much of the rags which generally go to the writing paper manufacturers, leaving less available for these people. Consequently, the prices on the other rags have gone up. So far, the writing men have not shown a disposition to meet the new demands, but it appears eventual that they must do so or—we think they will do so. Not much stock is being received from abroad, nor is it likely that we will get very much in the future. Bagging is in great demand and is soaring in price. Gunny is being quoted at as high as 2.12½c.; bright bagging is quoted at 1.75c.; sound bagging is quoted a 1.50c; mixed bagging is quoted at 1.40c; wool tares are quoted at 1.75c. Manila rope is active and advancing. Present quotations are about 2.90c. to 3.25c. Old waste papers are fairly satisfactory. While prices might be somewhat higher, the volume of business is keeping up well. Mixed papers are moving in good shape at about 27½c. to 30c. Shavings, manilas and krafts are in fair demand. Book stock and ledger stock have not taken on any life, yet, but are said to be getting for some more activity.

The paper market has been splendid in every respect. Orders have been coming in from all sides and mill reports from all parts of the country show that an excellent state of affairs exists. Through the West and even through the East, mills are operating at full capacity will many orders ahead. The writing mills, which were so poor during the summer, have taken on a great deal of added business and are now moving well. Colors, of course, still present much difficulty. Prices in general have been raised on the deep tints. Notices have been issued by the Writing Paper Manufacturers' Association and by the Cover Paper Manufacturers' Association notifying the jobbers of the impossibility to match some colors and that it would be necessary to take the nearest shade to a sample. The freight question is becoming a serious one. The number of idle cars available has been greatly decreased, so that mills find it hard to get enough of them to ship stock in time to meet the demands of the jobbers. Orders being taken now, do not specify any certain date for delivery.

Newsprint is active and strong. Prices are fairly high and will, from present appearance continue so for some time. The export demand is good and is said to be a large factor in the present inclination of the market. Tissues are tending upward very strongly. This market has been affected vitally by the sulphite movement. Advances have already been announced and further advances are being anticipated. Pure white tissue is liable to become a scarcity if no relief is felt in the bleached sulphite. Manila wrappings are in brisk demand and continue upward. The mills making these goods are running full with orders ahead. Krafts are very active and have been advanced twice already. Book papers are improving. Boards are lively and firm. Quotations on the various grades of boards have gone up. Paper bags are a little better.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Unbleached Sulphite, impt., 2.25 to 2.35c., delivered.
Bleached Sulphite, domestic, 2.95 to 3.15c., delivered.
Bleached Sulphite, impt., 3.50 to 4.00c, ex-dock, N.Y.
Easy Bleaching, impt., 2.40 to 2.85c ex-dock, N.Y.
Manila, wood, 2.30 to 3c, delivered.
Kraft, No. 1, (dom.) $3.60 to $3.75, f.o.b. New York.
Kraft, No. 2, (dom.) $3.35 to $3.50, f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $24 to $25 per ton, delivered.
Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $20 to $23 per ton, delivered.
Boxboards, chip, $22 to $24 per ton, delivered.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, white, cylinder, 40c to 42½c, f.o.b. New York.

Unbleached Sulphite, impt., 1.85c to 2.05c., ex-dock, N.Y.

Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 215 to 225c

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.

INDUSTRIAL CHEMISTS ORGANIZE.

At the Chemists' Club, 52 East 41st Street, New York, Wednesday evening, November 10, was a notable gathering of well known industrial chemists, at a dinner tendered by the management of the exposition, to discuss plans for the next National Exposition of Chemical Industries. An Advisory Committee for the 1916 National Exposition of Chemical Industries to be held at the Grand Central Palace, New York City, week of September 25th, 1916 was appointed. Dr. Chas. H. Herty was elected to serve as chairman of this committee for the coming year.

Plans for enlarging and increasing the scope of the coming Exposition were laid, which will assure a very large exposition both from the attendance standpoint as well as exhibits. The plans include using several floors of the Grand Central Palace, with speakers in the evening and motion pictures during the day from 11 A.M. to 7 P.M. Next year an entirely new set of motion pictures will be shown, covering a very much wider field of industrial activites.

McLEOD PULP AND PAPER COMPANY.

The McLeod Pulp and Paper Company of Liverpool, Nova Scotia, whose board mill was burned down Nov. 1, will not rebuild this plant. They have also been operating two ground wood mills in conjunction with this board mill. These pulp mills were not damaged or destroyed by fire. The company now purposes to operate these ground wood mills until March 1, when they will shut down until present conditions in the pulp market change and improve.

This company has very large water power rights in Nova Scotia. The plant was bought from an old English Syndicate, and was rebuilt and enlarged, building up a good English export business, but the present markets for their board and ground wood do not warrant the company continuing in business, especially since the wood supply in that district, as in all Nova Scotia, is rather limited.

The plant will probably be utilized along some power developing lines, instead of the manufacture of pulp. Mr. S. Downer, who has been manager of this company for the past nine years, is retiring to locate elsewhere.

Their products have been handled almost exclusively by Becker and Co., of London, and through the Canadian Board and Paper Co. They have had an excellent export businesss of account of the fact that they have a harbour open all the year round.

PERSONAL NOTES.

Robert S. Hare, Superintendent of the Jonquiere Pulp Co., Jonquiere, Que., has resigned and left Jonquiere. His plans for the future are not definitely decided yet. Mr. Cullen has been appointed superintendent.

Mr. Ethelbert McLean, oldest son of Mr. Angus McLean, vice-president and general manager of the Bathurst Lumber Co., was married on November 17 to Miss Gladys Bean, of Buffalo. After their honeymoon they will reside in Bathurst, N.B.

ANNUAL MEETING AMERICAN FORESTRY ASSOCIATION.

January 17-18, 1916, are the dates for the annual meeting of the American Forestry Association at Boston, Mass, at the Hotel Copley-Plaza.

WANT ADVERTISEMENTS.

POSITION WANTED — As Superintendent or Manager. Experienced in manufacturing pulp and paper from resinous woods, spruce and hardwoods, separately and in combination, strong fibres, high finish, white and colors. Practical in every detail of mill construction, upkeep and operation. Correspondence solicited. Address "Experience," Pulp and Paper Magazine, 45 St. Alexander St., Montreal.

MACHINE TENDER for Sulphite Cylinder Drying Machine wanted. Apply to "Drying Machine," Pulp and Paper Magazine, 45 St. Alexander St., Montreal.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

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A Warning

The Dominion Government seems possessed of the idea that we have not a sufficient number of pulp and paper mills in this country, and is trying to add to the number.

The Forestry Branch has been receiving bids from pulp and paper interests for the use of a certain tract of forest. It is stipulated that every bidder must be prepared, in the event of receiving the grant, to build a pulp and paper mill, to employ a stated number of men in the woods, and in the mills, to turn out a certain tonnage of paper each day, and to invest a certain amount of money in the project.

It is all very well to encourage the pulp and paper industry, and to build up a strong domestic labour market, but a government can easily be mis-led and overdo the whole business. There are now upwards of 65 pulp and paper mills operating in the Dominion. Millions have been invested in these plants, which are not only capable of taking care of the domestic business, but also export over $15,000,000 worth of paper per annum. The whole industry was jeopardized a few years ago when a few promoters who saw the old-established, well-organized plants doing a good business immediately got busy and organized new companies. They were interested in the stock market end of the business and knew nothing, and cared less, about the practical end of paper making. "Let us sell the stock and we care not who makes the paper—or squeezes out the water." As a result of the activity of these get-rich-quick artists a number of new mills were started; some of them seriously handicapped through over-capitalization. Some had to be reorganized, while the whole industry suffered more or less from the competition.

We do not advocate a monopoly of the business for existing mills, but we do advise care on the part of the Government. The pulp and paper industry, like all other industries, should grow naturally, and along proper economic lines. Hot house methods of growth or forced development of any kind is unnatural and artificial. To compete successfully in the world's markets our paper mills must not be handicapped by over-capitalization or by spoon-fed bounties and bonuses, but should be allowed to grow and develop with the development of the industry.

Canada possesses the raw material, the water power, a sufficient supply of labour and all the other factors necessary to make her a leader in the manufacture of pulp and paper. Already she is one of the world's greatest exporters of paper and can be trusted to increase her output. This, however, should be along natural, sound and economic lines, not as a result of Government bonuses nor through the activity of the promoters.

Forest Products Laboratories

Although the Forest Products Laboratories of Canada have been in operation for some time, and have been viewed by many of those who read the Pulp and Paper Magazine, the formal opening on December 3rd last will give renewed satisfaction among all who are interested in the development of the forests of Canada and the products derived from them.

The laboratories are the most recently welded link in a chain of development of which all Canadians should

be proud. Beginning with the establishment of the Forestry Branch in 1898, and following through the sequence of events which has placed the practice of fire protection and forest organization upon an immeasurably better basis than was the case before, there has been made strong basis for prosperity of which all may well be proud. Mr. R. H. Campbell, who has occupied the position of Superintendent, and later Director of Forestry in the Department of the Interior, is entitled to great credit for the steady progress, which he has made under the administration of his two Ministers. The Hon. Dr. Roche is to be congratulated, not only on having such an efficient lieutenant, but also for the sound judgment displayed in following the counsel of those enthusiasts who saw the need for the Laboratories and urged them upon the Minister. And not only has the Forestry Branch at Ottawa been productive of good works in itself, but it has also given to some of the other Provinces of the Dominion men of the stamp of Mr. H. R. MacMillan, Chief Forester of the Province of British Columbia (now Special Commissioner for the Department of Trade and Commerce in Europe in the interests of the forest industries in Canada) who have made the word "forestry" one widely known, and the work of the forester respected and admired throughout the Dominion.

To Mr. MacMillan indeed must undoubtedly be given much of the credit for the developments which have culminated in the Forest Products Laboratories of Canada. Without his enthusiasm and clear vision half a dozen years ago the laboratories might not now be in existence. And just as Mr. MacMillan deserves credit for the initiative, so those who took up his work in Ottawa when he left, and did the rough clearing in the actual establishment of the Laboratories are to be commended for their zeal in this most important work.

From the standpoint of the character of topography, Canada is overwhelmingly a forest country, and in so far as Canadians fail to take advantage of the opportunities for developing forest lands, and utilizing thoroughly the products which come from them, they will fail to take advantage of their birthright. Such an institution as the Laboratories, therefore, will find a sphere of untold service to the Dominion. The latent possibilities of that most necessary of all materials, wood, have scarcely been realized.

The Laboratories have come at a most opportune time. These are the days of inward searching and of careful husbanding. If Canadian industry to-day fail to take advantage of its opportunities, if it fail to realize the responsibilities which are thrown upon it by this great war, then truly it will have laid itself open to censure for many a decade. But the Government, as represented by the Hon. the Minister of the Interior, can well rejoice in the deep interest which was shown by the representative gathering in the inauguration of this agency for research and expansion in industry. Apparently the leaders of Canadian industries, and the prominent men in the professions and in education, are gripping the problems which are presented to-day with deep seriousness. Science and industry must walk hand-in-hand in closer companionship than ever before. The one remaining problem is to ensure throughout the great mass of the people as keen an appreciation of the situation to-day as was exhibited by those who attended the opening of the Forest Products Laboratories of Canada.

Canada has a great industrial destiny to fulfil. Unless the history of the past century is to be reversed, it must be along the lines of the development of science. Surely, therefore, there is cause for satisfaction for this new development in the field of wood-using industries.

Christmas Trees

The Slaughter of the Innocents continues this year as formerly! This does not mean the killing of babies by the Huns or any of the other deeds of frightfulness perpetrated by the barbarians of Central Europe. It refers to the ruthless cutting down of young spruce trees to supply the Christmas trade.

Each year on this continent hundreds of thousands of young trees are cut down and shipped to the large centres of population, where they provide a fitting background for the ubiquitous Santa Claus. Whole train loads of evergreens, gathered from a thousand hillsides and wood lots are rushed to a market which seems to grow more insatiable and widespread each succeeding season.

At a time when the Conservation of our resources is looming large in the thoughts and plans of our big business men and statesmen, it seems unfortunate that the wholesale and indiscriminate cutting of young trees should be allowed to continue unchecked. A few years ago lumbermen cut and slashed over their limits with an utter and total disregard of the young timber growing up. It was only when attention was called to the wastefulness of their methods and legislation against such tactics put into force that a change of policy was adopted. To-day a lumberman who needlessly destroys young and growing timber while cutting over his limits is regarded as an enemy of society. Some such view should be taken of the farmers, dealers and others who cut down acre after acre of evergreens from places designed by nature as forest centres.

We do not wish to condemn the whole practice of supplying the world with Christmas trees, but we do advocate regulation, proper restrictions and a general supervision of the cutting of young evergreens. Where trees are too crowded or where they are growing on land suitable for farming, they might well be cut down, and utilized for decorative purposes. We however, do condemn the present wholesale indiscriminate, ruthless cutting of young trees for the Christmas trade. The man who cuts off these evergreens

gets a few paltry cents, but costs the country thousands of dollars. We have far too many denuded, barren hillsides and sand-swept stretches of land; conditions brought about by just such policies as that of cutting down acres of young trees, for the Christmas trade. We either must have regulations or else secure artificial trees for the trade. We have too many Esau's —men willing to sell their birthright for a mess of pottage.

The World's Paper Trade

Recently compiled statistics show that the world's production of paper in 1909 amounted to 7,971,000 short tons. Of this total the United States produced 40 per cent, Germany 18.6 per cent, and Great Britain 12 per cent. The value of the United States paper products last year amounted to over $350,000,000, produced from 85 mills. In 1912 Germany produced $124,000,000 worth of paper, an increase of 25 per cent in the past five years. Great Britain is the world's chief importer of paper and paper manufactures, and second as an exporter. In 1913 she imported $37,000,000 worth of paper and exported $17,900,000 worth.

Of the world's total trade in paper in 1913 amounting to $165,000,000, the following are the chief importers and exporters: Great Britain imports 33 per cent of the total, then comes the United States, with 20.3 per cent, Russia 16.7, Australia 9.7, Argentina, 8.5, Canada 7.8, German 7.4, Brazil 6, China 5.9, and India 5.3 per cent.

Of exports first place is held by Germany, with 46.1 per cent, valued at 62,500,000, then comes Great Britain, with 15.5 per cent, Canada third, with 15.4 per cent, Sweden 11.5, United States 10.7, Finland 10.3, France 9.1, Norway 8.6, Holland 8.0, and Belgium 7.1 per cent.

Canada's exports, which amount to over fifteen per cent of the world's total, were valued last year at $15,480,000, or four times as much as seven years ago. Of our total exports $14,000,000 was printing paper, of which $12,000,000 worth was sent to the United States.

Undoubtedly there are many opportunities for Canadian paper men to extend their markets in the present disorganized state of the world's trade. In South America, Argentina imports over $8,500,000 worth each year, of which 34 per cent comes from Germany. Brazil, with imports of $6,000,000, obtained nearly 25 per cent from Germany, while Chili secured 62 per cent of her $2.900,000 worth of paper from the same country.

To a lesser extent the same is true of other outlying parts of the world. Germany is now cut off from trading with the world at large, and her handicap should be our opportunity. It is good business as well as good patriotism to put the knife into the unscrupulous Huns.

FOREST PRODUCTS LABORATORIES FORMALLY OPENED

Important Event in Montreal

An event of unusual importance in the development of Canadian industry took place on Friday, December 3rd, in Montreal when the Forest Products Laboratories of Canada were formally opened. About forty-five men of prominence from the Government, McGill University, industrial and professional associations, and business life met together around the Hon. Dr. Roche, Minister of the Interior, in whose Department the Laboratories have been organized, to give an auspicious beginning to the undertakings of the institution.

Arriving about noon, the guests were received by Sir William Peterson, Principal of McGill University and were escorted in parties around the different departments of the Laboratories to view the work being undertaken.

The Laboratories are situated in the old Molson property at No. 700 University Street, which is admirably suited to the needs of the staff. The visitors saw first of all an excellent exhibit of Canadian timbers of many species, samples of specimens which had been taken from testing machines showing the typical faults, and also a fine display of fungi destructive to Canadian woods. The manufacture of acetone, the preparation of wood sections for microscopic examination, the impregnation of ties with creosote, the testing of timbers in standard strength machines, and the manufacture of paper, were all viewed in turn. Dr. John S. Bates, the Superintendent, was capably assisted by his staff. In this connection it is interesting to note that of a total permanent staff of thirty, seven are on active military service, leaving only seventeen technical men at the Laboratories, and the balance make up the office staff in the division of administration. The staff is as follows:

John S. Bates, Ph.D., Superintendent .

W. B. Campbell, Asst. Superintendent, (on active service).

H. N. Lee, Acting Chief, Division of Timber Physics.

R. W. Sterns, Chief, Division of Timber Tests.

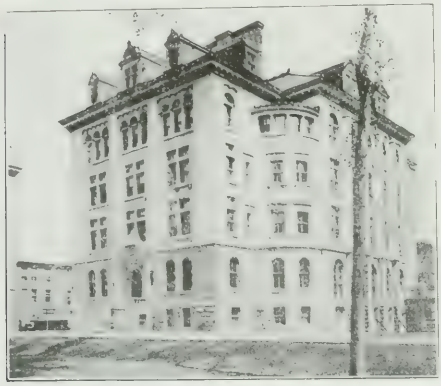
O. F. Bryant, Acting Chief, Division of Pulp and Paper.

W. G. Mitchell, Chief, Division of Wood Preservation.

The organization and equipment of the laboratories as described by Dr. Bates in the Canadian Forestry Journal show the thoroughness and practicability of those behind the project. Dr. Bates points out that the plan of co-operation with McGill University has proved to be a very satisfactory one and this union of Government and university in scientific research may be considered as marking an era in Canada's development. The relation of the laboratories to the university is flexible and the co-operation is primarily one of goodwill, the university having provided quarters for the laboratory work, and the Federal Government,

through the Forestry Branch, paying all salaries and furnishing all equipment. While the main function of the laboratories is the carrying on of scientific research on forest products for the benefit of Canadian wood-using industries and the public at large, there is an opportunity for the students of the university to keep in close touch with the work by personal lectures, delivered to the engineering students by members of the staff. A number of specially qualified students and graduates have also been appointed on the technical staff of the Laboratories.

There has been more or less misunderstanding during the early stages of organization regarding the



MACDONALD ENGINEERING BUILDING, McGILL UNIVERSITY,
Where Timber Tests are Made.

exact function of the laboratories. The Forestry Branch is engaged mainly in such problems as administration of forest reserves, fire protection, reconnaissance surveys, tree planting, and in general educating of public opinion in the proper care of living trees. Forest Products Laboratories on the other hand are interested in the conservation of forest resources by proper utilization of the raw material. The work is, therefore, largely of a chemical, physical and engineering nature and has to do with the intensive study of wood itself and the many products which can be manufactured therefrom. Investigations have been undertaken with the view of extending the knowledge of wood and its products, pointing out improved methods for using the raw material furnished by our Canadian forests and finding ways and means of utilizing the vast amount of waste wood which is occasioned in the lumber and allied industries.

The period to date has been mainly one of organization and preparation for systematic, scientific work. The progress has been slow in some respects owing to the newness of this type of work in Canada and the small supply of specially trained technical men. However, a real start has been made in this work, which is of such vital importance to Canada.

At the beginning of the fiscal year, April 1st, 1914, Dr. Bates took over the duties of Superintendent in succession to Mr. A. G. McIntyre. At this time the staff numbered ten, made up of seven technical men and three office assistants. Twelve months later the permanent staff totaled twenty-three, while at the present time the permanent staff numbers thirty.

Up to the fall of 1914 the staff found temporary accommodation in the Old Medical Building, granted by McGill University. As stated the laboratories are now quartered for a period of four years in the buildings at 700 University street, which were recently purchased by McGill University. The office building is a large stone structure containing about twenty-five rooms in all. Two rooms at the basement have been provided with concrete floors, benches, piping and apparatus for use as wood preservation laboratory and fungus pit. On the ground floor one room is used as clerk's office and a large room has been set aside for exhibits of forest products. The first floor provides four offices and a room for library and conferences, while the top floor contains two offices, drafting room, chemical laboratory and dark room for photographic work.

The adjoining building has been reconstructed to serve as an experimental paper-mill. This is a two-storey structure of brick and stone, 90' x 30' and the interior has been almost completely reconstructed and provided with concrete floors, water, gas, steam, electric light, electric power and drain connections.

For the work in timber testing the university placed at our disposal the testing laboratory in the Engineering Building, which provides most excellent facilities for this branch of work. A wood-working shop has also been equipped in the building adjoining the experimental paper-mill. A portion of the yards has been in use for the storage of wood, special precautions being taken to prevent fungus infection. A specially constructed shed has been built for the air seasoning

HON. Dr. W. J. ROCHE,
Minister of the Interior.

of small wood specimens. A small sawmill on the outskirts of the city has been in use for the working up of the larger logs.

The organization includes the Division of Administration and the technical divisions of Timber Tests, Timber Physics, Pulp and Paper and Wood Preservation.

The division of Administration is concerned with the general operation of the laboratories, correspondence, library and so forth. A favorable start has been

made in collecting a library containing information on the special work which concerns the laboratories. The main library of McGill University is consulted for general reference works so that the task of accumulating a special library is very much simplified. A special system has been developed for the collecting and indexing of information, as accurate and comprehensive knowledge is necessary in connection with the library work and the answering of inquiries which are received in large number. Preliminary plans have been made for the collecting and exhibiting of wood specimens, samples of treated wood, pulp and paper, wood distillates and the other numerous products which can be obtained from the raw material furnished by Canadian forests.

One Hatt-Turner Impact testing machine and 30,000 lb. Olsen Universal machine have been installed in the University testing laboratory. The 200,000 lb. Wicksteed and 150,000 lb. Emery machines which form part of the University equipment have also been in frequent use for timber testing. Arrangements have also been made for adjusting the University's 60,000 Riehle testing machine for the laboratories' work. With very little effort and expense on the part of the laboratories there has been made available the most complete and satisfactory testing equipment in Canada.

Project No. 1, "Mechanical and Physical Properties of Canadian Woods as Determined by Tests on Small Clear Specimens" was undertaken for the purpose of establishing the strength characteristics of the important Canadian wood species. The testing procedure includes eight strength tests—static bending, compression parallel to grain, compression perpendicular to grain, shear, tension, impact bending, cleavage and hardness. The first species under test is Douglas Fir, obtained from Alberta and British Columbia. The results have shown that the fast growing Douglas Fir of the Pacific Coast has unusual strength and that the slower growing and smaller mountain types, although more affected by knots and other defects are of very good quality. The tests confirm the fact that Canadian Douglas Fir is a first-class structural material.

Project No. 2, "Strength Functions and Physical Properties of Nova Scotia Mine Timbers" has been carried on in connection with a general investigation of Nova Scotia mine timbers instituted by McGill University in co-operation with the Forestry Branch. Over seven hundred representative pit props and booms were obtained from Nova Scotia, including five species—Black Spruce, Balsam Fir, White Birch and Yellow Birch. Most of these timbers have been tested in commercial sizes in the large machines. Much valuable information has been obtained from these tests and results will be ready for publication in the near future.

Considerable equipment, including microtome, microscope, photomicrographic apparatus, projection lantern, cameras, electric ovens, autoclave, balances and so forth, has been obtained for the division. The work has to do largely with the determination of physical and structural properties of wood by the testing of moisture content, specific gravity, percent springwood, percent summerwood, percent sapwood, percent heartwood, fibre dimensions, cell structure, microscopic characteristics and fungus infection. There has been considerable study to learn the relation of microscopic structure of wood to penetration by preservatives and other liquids. General botanical studies are also made. All the photographic work is done by this division, including the making of microscopic slides, photomicrographs and lantern slides of wood sections and pulp fibres as well as miscellaneous photographs, copies, enlargements, etc. Studies have been made to improve the methods of wood identification. Investigations are in progress on the relation of vapor pressure and shrinkage to the moisture content of wood.

Special attention has been given to the equipping of a thoroughly modern semi-commercial experimental paper mill and it is safe to say that when all the equipment is in place this mill will be without an equal in any of the centres throughout the world where experimental work of this kind is in progress. A special Fourdrinier paper machine has been installed, the machine being about 75 feet in length and turning out a sheet 30 inches in width. The machine is flexible in its adjustments and attachments and is designed to make practically all grades of paper. A single beater of 40 lbs. capacity and a double beater of 60 lbs. capacity have been installed with interchangeable basalt lava and steel rolls with individual motor drive to each roll. The remaining equipment in-

MR. R. H. CAMPBELL,
Director of Forestry, Ottawa.

cludes three stuff chests, riffler, screen, four pumps, five motors, two paper testing instruments, Erfurt sizing system and a variety of small apparatus. Sulphite and soda digesters and other equipment will be installed in the near future for the manufacture of wood pulp by chemical processes on a satisfactory scale. Preliminary work has been done on several pulp and paper investigations. Queen's University has co-operated in research on the chemical composition of waste sulphite liquor, which is produced in such large quantities by our paper mills.

A new Division of Wood Preservation was organized in October, 1914. The scope of this division includes the study of wood preservatives and methods of treating

wood to prolong the life of railroad ties, paving blocks, telegraph poles, posts, piling, trestle timber, mine props and structural timber in general. A study of wood destroying fungi has also been undertaken as well as methods of fireproofing wood. A certain amount of equipment in the form of retorts, pumps, motors, air compressor and so forth have been obtained for the carrying on of experimental work. Particular attention is being paid to the subject of railway ties in Canada.

Although it is not feasible to establish more than the four above-mentioned technical divisions at the present time there are a number of other branches of work in the field of forest products which demand attention and which should be taken care of in separate divisions some

Dr. J. S. BATES,
Superintendent Forest Products Laboratories.
To whom the forest industries of Canada are looking for guidance and support.

time in the future. There are decided limitations to the accommodation and facilities for experimental work in the present temporary quarters and provision for new divisions is somewhat uncertain until a new and fully equipped building is secured.

A study of the lumber industry with special reference to sawmill operations and waste wood utilization is perhaps the most pressing of these needs. Since lumber is by far the most important of Canadian forest products it is clear that there should be made a special study of this industry from beginning to end. The technical assistance which these laboratories might give to the industry would be partly in carrying on direct investigations but probably more in suggesting improved methods of operation and utilization of waste.

A Division of Chemistry would provide for experimental work on the recovery and refining of essential oils, turpentine, rosin, tannins, dyes, potash and other products from the leaves, branches, bark, trunk and roots of trees of various species.

Destructive distillation of hard and soft wood has attracted considerable attention in Canada. The hardwood industry now provides large quantities of wood alcohol, acetic acid, acetone and charcoal. It is interesting to note that wood alcohol is now in great demand for the manufacture of formaldehyde to disinfect the trenches and hospitals at the front, while acetone is necessary in large quantities as a solvent for gun cotton in the manufacture of cordite, which is the explosive used in shrapnel and rifle cartridges. An investigation is now in progress to study the possibilities of resinous wood distillation as applied to Western Yellow Pine stumps in British Columbia. The products of this process are turpentine, pine oil, light oils, pine tar oil and charcoal, together with a variety of secondary products. These laboratories have been of assistance in a general way in promoting these industries.

The hydrolysis of wood for the production of sugar from which ethyl alcohol (grain alcohol) can be made and the use of the wood residue as cattle food are discoveries of recent years which give promise of important industrial development in the future. At present the laboratories are unable to do any experimental work along this line.

The investigations made by the laboratories are regulated by an Advisory Committee of seven members who represent a wide range of experience and interest.

The members of the staff are called upon from time to time to give lectures before scientific societies, university students or the general public and a good deal of interest has been stimulated in this may.

The publications contributed to date by the laboratories are Forestry Branch Circular No. 8, "Forest Products Laboratories," Circular No. 9, "Chemical Methods for Utilizing Wood Wastes" and Bulletin No. 49, "Treated Wood Block Paving."

An important function of the laboratories has been that of answering inquiries on forest products. In this way the laboratories have undertaken to act as a bureau of information for the benefit of the public.

The laboratories are co-operating as far as possible with various industries, railways, universities, societies and individuals. In fact the use of wood is a subject which is so extended and varied that the problems can only be solved by united efforts of all who are concerned. It is a mistake to think that the Forest Products Laboratories can, in some mysterious way, bring about a new era in the wood-using industries and by a wave of the wand transform all our wood waste into products of great value. This is a slow process which can only be brought about by faithful and systematic work and the gradual introduction of scientific methods into industry. The co-operation and interest of everyone engaged in the handling of wood and its products is necessary if Canada is to maintain a high place among the nations in the proper utilization of her forest resources.

After inspecting the laboratories, the guests assembled in the library to listen to speeches by the Hon. Dr. Roche, Minister of the Interior, and others. Dr. Roche in declaring the Laboratories open expressed gratitude to McGill University for the co-operation which had ben shown in the creation of the Department. He complimented the staff of the University upon the most gratifying progress which had been made, and expressed appreciation of the Director of Forestry, Mr. R. H. Campbell. The institution of the Forest Products Laboratories said Dr. Roche was one of the bright spots in his term of office as Minister of

the Interior. He would look back with unalloyed satisfaction to this important development, which could be open to no criticism, and which represented one of the true forward steps in Canadian industry. Dr. Roche modestly took no credit to himself for the institution of the laboratories. He placed the credit to certain foresters, manufacturers and others who since 1909 or 1910 had been making strong representations to the Government. He believed that the scientific work which would be done in the laboratories would have untold value in the world of Canadian industry.

Sir William Peterson, who followed, stated he was proud to be the ally of the Minister of the Interior in this matter, since he believed a university should be a centre of practical use to the community as well as a seat of learning. This was the first example of what could be done in the advancement of applied science by co-operation between the University and the Government.

"Nothing has brought the universities so close to the people as this war", said Sir William. The fifty-two universities of the Empire have sent 65,000 men to the front. We do not want ever to have to go to Germany for anything again, and we want to collaborate with the Government to devise means to avoid this. It is not a question of what it will cost to do the thing, but what it will cost not to do it."

Mr. T. H. Wardleworth, Chairman of the Montreal Branch of the Canadian Manufacturers' Association, next spoke. Mr. Wardleworth laid stress upon the importance of the experimental work which would be carried on at the Laboratories to manufacturing of many kinds. To the Government he extended congratulations upon the strong hold which they had taken of problems which had needed solving, and in bringing about the organization of the Laboratories. McGill University he complimented upon their hearty co-operation in a project of real practicability. Mr. Wardleworth said that he envied the staff of the Laboratories upon their youth, which it was not the privilege of all to enjoy at the present time. He was envious too of the opportunity which lay before young scientists in Canada to-day, and not the least of these the staff of the Forest Product Laboratories. The excellent work which had been done in building up the equipment and the organization was a matter for great satisfaction to Canadian industry. Further, said Mr. Wardleworth the actual results which would accrue would immensely justify the work which had been undertaken.

The Hon. Sydney Fisher, who spoke next, warmly congratulated Hon. Doctor Roche upon this fresh example of the efficient manner in which he was managing his department of the Government. It was, he said, an instrument admirably designed to apply science to the aid of practical industry. It was especially designed to stop forest waste, and to that extent to increase the value of the country's domain.

Dr. Hugh P. Baker, Dean of the New York State College of Forestry, Syracuse, N.Y., speaking after the Hon. Mr. Fisher, expressed great pleasure at being present upon the occasion at the kind invitation of the Laboratories. The United States, he said, was looking to Canada for leadership in the practice of forestry and in the proper development of methods of utilization of forest products, since Canada was profiting by the experience of the United States. Dr. Baker told of the development taking place in the School of Forestry at Syracuse which now has enrolled 270 forestry students.

The State of New York, he stated, had granted a large sum for building the Eastern Forest Products Laboratory, whose home will be completed in the spring, and the equipment will then be installed. This institution will specialize in pulp and paper and wood distillation, because of the development of these industries in the Eastern United States, and because the other fields are largely taken care of by other Government institutions. The work is to be done as far as possible on a semi-commercial scale, and in close co-operation with the manufacturing industries affected. The Forest Products Laboratories of the United States Department of Agriculture at Madison, Wis., is covering a larger and more general field including timber tests.

Dr. Baker hoped that the Forest Products Laboratories of Canada, and the Laboratory which will be under his charge would work in hearty co-operation, since the problems facing the two institutions are very much the same.

Mr. R. H. Campbell, Director of Forestry of the Department of the Interior, expressed himself as gratified not only with the development of the Laboratories, but with the response of the manufacturers, as was evidenced by the great interest taken in the Laboratory work, and in the large attendance in the opening ceremonies. He hoped that the members of Canadian wood-using industries would avail themselves fully of the opportunities opened up by the Forest Products Laboratories. There was little doubt, he said, that the Laboratories would fill a large sphere of usefulness in conserving Canada's resources, and in pointing the way to improved methods of utilization of the raw material furnished by the forests.

Referring to the enormous waste which had been suffered by the forest in the past half-century, Mr. Campbell spoke with feeling of the work which had been done by Mr. William Little of Montreal in arousing a public interest in forest conservation, and in forming the American and Canadian Forestry Associations over thirty years ago. Mr. Little, he said, deserved the gratitude of the country for his early advocacy of forestry methods in days when there were few to heed the warning which has been shown to have been so necessary.

Following the addresses the guests partook of luncheon at the Mount Royal Club.

The following were present at the gathering:

Hon. W. J. Roche, Minister of the Interior, Ottawa; R. H. Campbell, Director of Forestry, Dept. of Interior, Ottawa; Dr. A. McGill, Chief Analyst, Dept. of Inland Revenue, Ottawa; Dr. C. G. Hewitt, D.Sc., Dominion Entomologist, Dept. of Agriculture, Ottawa; R. Grigg, Commissioner of Commerce, Dept. of Trade and Commerce, Ottawa; J. M. Macoun, C.M.G., Asst. Botanist, Geological Survey, Dept. of Mines, Ottawa; F. Howard Wilson, Montreal; J. A. DeCew, Montreal; Dr. R. F. Ruttan, Dept. of Chemistry, McGill University, Montreal; Carl Riordon, Riordon Pulp & Paper Co., Ltd., Montreal; Prof. H. M. Mackay, Dept. of Civil Engineering, McGill University; R. O. Sweezey, Royal Military College, Kingston, Ont.; Dr. Frank D. Adams, McGill University, Montreal; Sir Wm. Peterson, K.C.M.G. McGill University; Mr. Walter Vaughan, Sec'y McGill University; Dr. H. T. Barnes, F.R.S., McGill University; Dr. J. B. Porter, Faculty of Applied Science, McGill University; Prof. H. O. Keay, Faculty of Applied Science, McGill University; Prof. E. Brown, Faculty of Ap-

plied Science, McGill University; Prof. C. H. McLeod, Faculty of Applied Science, McGill University ,Montreal; Dr. F. C. Harrison, Principal Macdonald College, Ste. Anne de Bellevue, Que.; Dr. J. F. Snell, Macdonald College, Ste. Anne de Bellevue, Que.; Prof. Carrie M. Derick, McGill University, Montreal; Ellwood Wilson, Laurentide Co., Ltd., Grand-Mere, Quebec; Clyde Leavitt, Forester, Commission of Conservation, Ottawa; E. J. Zabitz, Provincial Forester, Toronto, Ont.; Robson Black, Sec'y Canadian Forestry Association, Ottawa; C. Howard Smith, Howard Smith Paper Mills, Ltd, Montreal; J. H. Sherrard, Pres. Can. Mfrs' Assoc, Montreal; George A. Slater, Vice Prest. Mfrs. Assoc., Montreal; Roy Campbell, Sec'y Can. Mfrs' Assoc., Montreal; R. A. Ross, Vice Pres. Can. Soc. Civil Engineers, Montreal; Walter J. Francis, Chairman, Can. Soc. Civil Engineers, Montreal; A. Surveyer, Councillor, Can. Soc. Civil Engineers, Montreal; F. H. Wardleworth, Chairman, Society of Chemical Industry, Montreal; M. G. Blaiklock, Chief Engineer, Maintenant of Way, G. T. R., Montreal; C. E. E. Ussher, Passenger Traffic Agent, C. P. R., Montreal; B. M. Winegar, Forest Inspector, C. P. R. Montreal; Frank Hawkins, Sec'y Can. Lumbermen's Assoc., Ottawa; Hon. Sydney Fisher, Ottawa, Ontario; Howard Murray, Vice Pres. Shawinigan Water & Power Co., Montreal; Smeaton White, Montreal; Capt. J. A. Weir Johnson, A. O. D., Montreal; Wm. Kelly, Canadian Explosives Ltd, Montreal; J. B. Bell, Chief Chemist, Canadian Explosives Ltd., Montreal; William Little, Westmount, P.Q.; T. L. Crossley, Laboratory of Dr. J. T. Donald; Dr. Hugh P. Baker, Syracuse University, Syracuse, N.Y.; Prof. S. J. Record, Forestry School, Yale University, New Haven, Conn.

THE MANUFACTURE OF HIGH GRADE SULPHITE PULP

By L. WIMMER, Appleton, Wis.

(Specially Written for Pulp and Paper Magazine.)

Instalment IV.

Acid for cooking should be of the right strength and combination. For cooking green hemlock or spruce the acid should be as follows:

Total SO_2—from 4.00% to 6.00%
Free SO_2—from 2.80% to 5.80%
Combined—from 1.2% to 1.30%
Lime 1.05% to 1.14%

In cooking dry wood either spruce or hemlock the acid may be a little weaker, especially the combined, but by proper operation of the digesters and reclaiming system there can be nothing saved by using weak acid, for when the acid is up to strength once it will stay up, as all the gases received are stronger and consequently the raw acid can be made weaker and still be strong after it is reclaimed.

Side relief on digesters is becoming more popular, and is a great help to systematic cooking, as also in the recovery of gases and reduction of sulphur consumption per ton of pulp. The principal object of the side relief is to recover more dry gas and less wet liquor, which weakens the acid when all the blow back is recovered. (Note Fig. 3.)

Outlet B on Figure 3 represents the side and A the top relief. To use the side relief to best advantage use as follows: After the digester is up to pressure relieve at the top until the temperature is up to about 120 to 130 deg. Centigrade, which is about 1½ to 2 hours, then close the top entirely and open the side for about 1½ to 2 hours, according to requirement. (The liquor can be relieved pretty fast on the side), then open the top again and there will be nothing but dry gas to finish the cook. Should the liquor come to the top again, the top must be closed and more liquor blown off on the side again. On large digesters there should be at least from three to five hours of dry gas on each cook at the end; on small digesters there is less.

Cooking can be done more systematically by using the side relief for the reason that the top strainer, when blowing dry gas the most part of the cooking never gets plugged, and the temperature can be brought up steadily, and the whole cooking process carried out under perfect control. Details regarding the saving of sulphur through the use of the side relief will be given later.

Thermometers to read the temperature during the cooking of a digester are generally placed on the side about 10 feet below the top. Some mills have the thermometer on the top placed in the digester head. This latter arrangement is not satisfactory, for it is a known fact that gases under pressure rise in temperature without applying heat, and therefore the correct temperature of the acid in the digester can never be determined by using the top, while the side temperature gives the heat in the acid which is cooking the wood, and must be taken as the correct one.

A good plan is to have one thermometer at the top and one on the side. It will be noticed that after a digester is up to pressure and gas valves opened, the top temperature will jump up quickly until about 140 deg. Centigrade. The side temperature will stay behind about 15 points until the end of the cooking, when both thermometers will read about the same.

Cooking time.—From an economical standpoint, to get the largest daily production per digester, and to save sulphur, the best time to cook is about 8 to 9 hours, but when a higher grade is wanted the slower a digester is cooked the stronger is the pulp.

Following are three digester reports taken from practice.

No. 1 is a memorandum of a high quality unbleached sulphite pulp. It will be noticed that the pressure is held not over 72 pounds, and the temperature not over 150 deg. Centigrade.

No. 2 is a memorandum of a strong pulp for bleaching either spruce or hemlock. Pressure is still kept lower and temperature held below 150 deg. Centigrade.

No. 3 is a memorandum of a good quality sulphite

cooked as fast as possible without waste of material. This last report can also be used for a good bleaching quality, where no extra strength in fibres is wanted.

In systematic cooking there should be definite rules followed for each grade of pulp. The cooks should handle the digesters about the same way. Much harm can be done by not having a regular cooking schedule. In many cases the cooks have to take the blame for things they could never help.

In getting the best results cooking sulphite pulp, the steam should be absolutely dry, the pressure in digester kept even—not over 75 lbs. Boiler pressure should be steady or steam lines provided with reducing and regulating valves, good wood and even chips used, and recording gauges and thermometers employed.

Reclaiming or Recovery of Bi-Sulphite Liquor.

There is hardly a part in a sulphite mill where there can be more saved or lost than in a good or bad recovery system. To reclaim all that possibly can be reclaimed, the start must be made first in getting all gases out of a digester before it is blown off. To do so the digesters are generally relieved pretty hard at the end of the cooking, and a good plan is to blow the pressure down to at least 60 lbs. before the digester is blown off. This will not only save gas, but will also help in making stronger fibre to some extent.

Whatever is blown back from digesters, either gas or liquor, must be cooled as low as possible before getting mixed with the raw acid from the acid plant. When the gases and liquor in digesters are all blown off at the top, and all is recovered, the acid is generally made stronger in the acid plant, especially when cooking hemlock and in using smaller digesters. Experience has proved that nothing is saved by blowing all the liquor back into the acid from the top of the digester unless some special system is used.

The above mentioned method of recovery is still in use in some of the older mills, by using this method the raw acid must be made strong. For instance:

Total SO_2	3.80%—4.20%
Free SO_2	2.30 —2.70
Combined	1.50 —1.50
Lime	1.31 —1.31

Under the best conditions the reclaimed acid is as follows:

Free SO_2—3.90%
Total SO_2—2.70%
Combined—1.20%

These results are only obtained on good spruce, on hemlock. The raw acid must still be made stronger to get the reclaimed acid up to above strength. In the above recovery system about 1-3, or 33 per cent to 35 per cent of the total liquor used in cooking is recovered. The combined is reduced about 30 per cent, the free SO_2 is raised a little, the total SO_2 remaining about the same. In a milk of lime system it is very hard sometimes, especially in the summer time, to keep the raw acid, especially free SO_2, up to the required strength, and whatever is saved in liquor in this system of recovery is lost in the acid plant. Besides, when cooking hemlock especially, the acid after it is reclaimed, gets a yellow-brown colour, which always affects the colour in the pulp.

Figure 5 indicates a reclaiming system used, which by careful operation has brought the sulphur down to from 265 lbs. to 280 lbs. per ton of bleached hemlock sulphite. No. 1 represents the digester tank, No. 2 the weak liquor tank, No. 3 the strong liquor tank, and No. 4 the reclaiming tank. A is top and B is side relief on digester, E is cooler for weak liquor from side relief, F is cooler for the dry gas which is blown off from digester at the last part of cooking, and also for the wet gas which is blown off from the digester at the first one or two hours, and reclaimed in tank 4.

The liquor blown off the side after the digester is up to about 125 deg. Centigrade is cooled in cooler E, and stored by itself in tank 2. Tank 3 is used as a storage tank for strong liquor. It will be noticed that

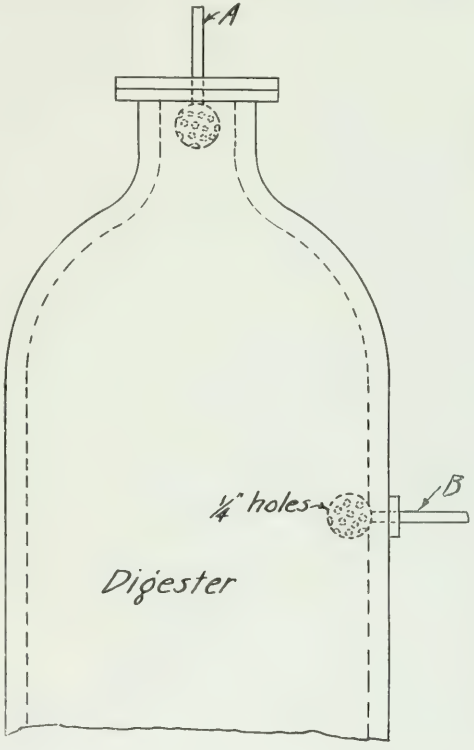


Fig. 3

the liquor from tank 4 runs into tank 3 at the bottom, thus when a digester is filled from the hole K acid is taken from the two tanks, thus always having even liquor.

The raw acid is made a

Total SO_2	of 3.70%
Free SO_2	of 2.20%
Combined	1.50%
Lime	1.31%

After reclaiming in tank 4 it will be brought up to about

Total	SO_2 —4.80%
Free	SO_2—3.40%

Combined —1.40%
Lime 1.22%

The weak liquor in tank 2 is about
Total SO_2 1.50%
Free SO_2—1.20%
Combined — .30%
Lime — .26%

When filling a digester with acid $^1/_4$ of the liquor is used from tank 2, which is weak liquor, and ¾ from tank 3, which is strong liquor. Tank 2 is provided with a measuring glass or device to know the exact contents in gallons per inch. The exact amount of acid (in gallons) used in the digester is also known, and therefore careful watching when filling a digester will do away with mistakes.

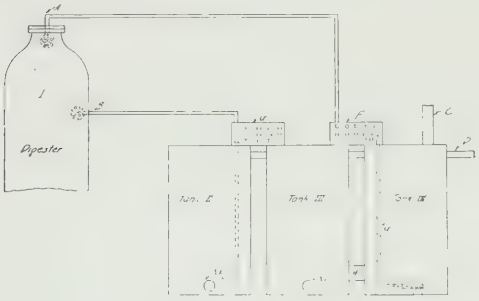


Fig. 5

In tank 3 and 4 we have a liquor of
Total SO_2—4.80%
Free SO_2—3.40%
Combined —1.40%

Three quarters of this liquor is used.
In tank 2 we have a liquor of about
Total SO_2—1.50%
Free SO_2—1.20%
Combined — .40%
One quarter of this liquor is used.

To get the average test for acid that goes into the digester the following figures will give a good average:—

¼ of weak liquor Total SO_2 1.50% ÷ 4 = .37%
Free SO_2 1.20% ÷ 4 = .30%
Strong liquor ¾ used Total SO_2 4.80% × ¾ = 3.60%
Free SO_2 3.40% × ¾ = 2.50%
Acid in digester is 3.60 + .37% = 3.97% Total.
2.50% + .30% = 2.80% Free.
1.17% Combined.
1.02% Lime.

In this system it is shown that the free acid can be made weaker in the acid plant, and is strong when going into the digester, besides all the liquor from the digesters is recovered, and the best point is the liquor from the digester is blown off before it colours, so this weak liquor does not affect the colour in the sulphite.

Figure 6 represents a recover system used and arranged by the writer, which gives the cooks absolute control of the acid, and any variation of acid from acid plant can be easily corrected. This recovery system also has demonstrated a considerable saving in sulphur over other systems.

B1 is digester, B2 is separator, B3 is storage, B4 is reclaiming, and B5 is part storage and part settling tank for raw acid. A1 and A2 are valves to control the flow of acid if necessary. A3 is outlet and valve for digester inlet. C1 is cooler for separator gas, C2 is cooler for dry gas and liquor blown from top of the digester. Under ordinary use after a digester is up to pressure the first one to two hours of wet liquor and gas are blown at top direct into acid through cooler C2 and reclaimed in B4.

After the top is closed the side line is opened, and this liquor is blown through separator, B2, which separates the liquor from the gas, the liquor passing out through the pipe F, and gas passing out at top through the pipe F4, and the cooler C1, and is reclaimed in the tank. The liquor passing out at the bottom of separator also cooled with water through the pipe F3 to hold any pressure up to 10 pounds in separator, and then run into the sewer. This separator works automatically and needs no attention unless the water supply at pipe F3 fails. If there is about 15 feet of acid in tank, it would take about 7 pounds of pressure to blow the gas into the bottom of acid tank from separator; to hold this gas pressure the seal of the bottom or return pipe must be 28 inches in length to every pound of pressure in separator. If it takes 7 pounds of pressure to blow gas into the acid tank from the separator, it would take $7 \times 28 = 167$ ins. $\div 12 = 14$ feet if the liquor and water are absolutely cool, but since this cannot be depended on, it is much safer to make return pipes about twice as long as needed. The drop bend F5 must not extend over one-half of the height of separator, else it would cause the separator to fill up when the digester lines are closed.

About two hours are relieved back into the liquor from top of digester; same is up to pressure, then about two hours at the side through separator, and again about three hours of dry gas direct into the acid and cooler at the end of cooking.

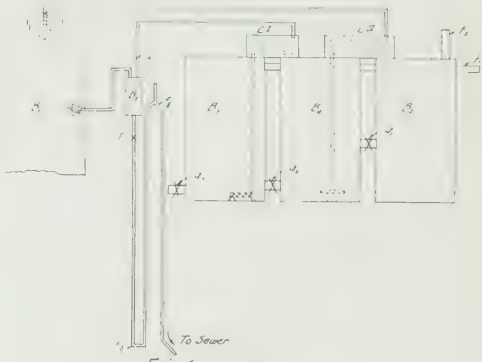


Fig. 6

Should the acid in tanks for any reason get weaker, not so much liquor is blown back from the digester, and more through the side. In case the acid is stronger and high in lime, more liquor is blown back from the digester direct into the acid. The advantages of this recovery system are:

The liquor in the acid plant can be made even, which is of great advantage in getting the best results in acid plant, and absolute control of cooking acid

by the cooks, not only the total strength, but also lime in acid to a certain extent.

The acid can be changed in the reclaiming system within a few hours to suit any wood and any condition.

Trying to regulate the cooking acid in an acid plant is wrong, as it sometimes takes days before any change is noticed, especially when a good quantity of acid is kept in the storage tank. A good deal of sulphur is wasted, and time lost, to say nothing of the harm that may result by cooking with weak liquor.

By using a recovery as above described, the man in charge of the mill can go home at night assured that he does not have to worry about acid or hard stock even when the moisture test in wood is up to 60 per cent.

Using the above system there were turned out 900 consecutive cooks of green hemlock of uniform quality without a single hard cook.

There are other reclaiming systems in use, for instance, an absorption tower where the gases are blown in at the bottom, and the raw acid is pumped in at the top. These towers are filled with wood blocks mostly oak. The gases are absorbed by the acid coming down through the tower while going up. It is claimed that all liquor from the digesters can be recovered and considerable sulphur saved.

The writer has had no experience with a system of this kind.

The points which should be kept in view in reclaiming or recovering sulphite liquor are:

The raw acid should be made as weak and even as possible.

All gases should be recovered from digesters.

Absolute control should be secured by the cooks, not only of the strength, but also of lime in acid.

NEW SALES OFFICE.

On January 1, 1916, H. W. Caldwell, Son & Co., will open a new sales and engineering office at 711 Main St., Dallas, Texas, in charge of J. C. Van Arsdell, who is well and favorably known in the industries of the Southwest.

By this addition to their sales force, the company hope to give even better service than heretofore to our many customers in this field.

PAPER BOX MAN DIES.

One of the oldest paper box manufacturers in the city of Toronto has passed away in the person of Mr. Joseph Harper Harrison, who died at the General Hospital a few days ago. Born in Manchester, England, in 1849, the deceased lived in Toronto since coming here at the age of 22. After conducting a business of his own for many years the late Mr. Harrison became Manager of the Robertson Bros., Limited. He is survived by his widow, four sons and two daughters.

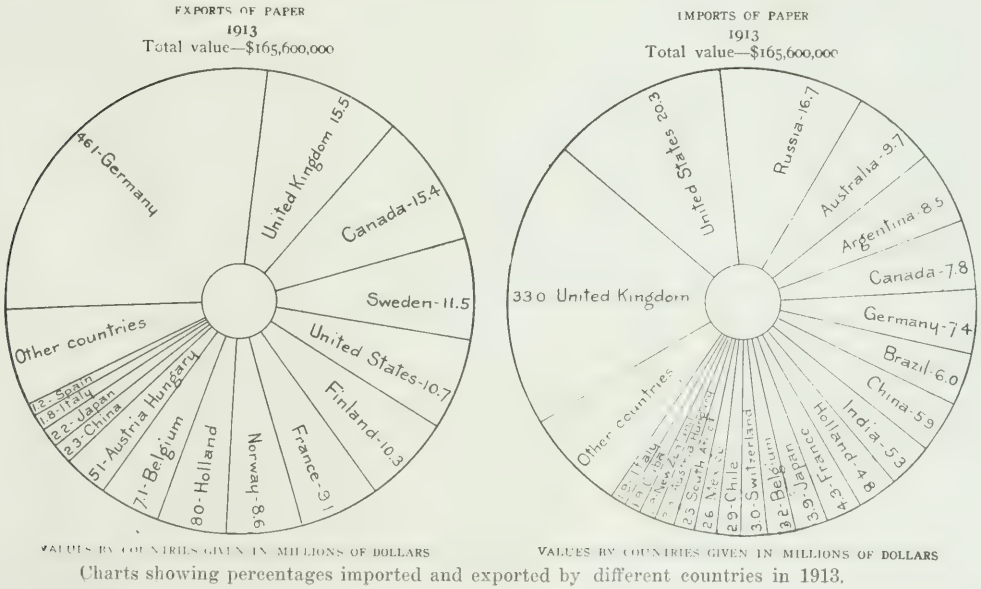
LEAVING FOR ARGENTINA.

Mr. C. de Wolf Reid of the Provincial Paper Company recently left for Argentina where he will open an office for his company and endeavor to create a bigger market for Canadian paper. Mr. Reid expects to be away for several months.

That there is a market for Canadian paper in Argentine is evident from trade returns.

Last year Canada exported to Argentina 6,760 rolls of printing paper valued at $13,221 and 2,856 rolls of wall paper valued at $191. She also exported paper N.O.P. valued at $39. As Argentina annually exports millions of dollars worth of paper, much of which formerly came from Europe there should be an opening for Canadian paper makers.

World's Imports and Exports of Paper



Charts showing percentages imported and exported by different countries in 1913.

Ottawa Notes

Ottawa, Ont., December 11 Pulp and paper manufacturers all over Canada are awaiting with considerable interest the judgment of the Railway Commission in the application of the railways for an advance of freight rates, including those on pulp and paper, east of Port Arthur. From inquiries made by your correspondent it would appear practically certain that judgment will not issue this year and may not be for some months yet.This reads somewhat curiously in the light of the attitude taken by the Commission when the matter first came up that things should be expedited to permit, if possible, of judgment being given in time for the opening of the shipping season last spring. However pulp and paper men, in view of the strong case advanced by their representatives when the case was before the Commission, are not worrying unduly as to the outcome.

According to reports from the busy Ontario town of Arnprior, on the Ottawa river some few miles from this city, the near future will probably see the establishment of a large mechanical pulp mill there, which will find its raw material in the pulpwood limits owned by the lumber firm of McLachlin Brothers of Arnprior. It is stated that some little time ago the J. R. Booth Company of Ottawa made an offer for the mill, site and limits of the McLachlin firm and that Senator Edwards of the W. C. Edwards Company of Ottawa was more recently negotiating with the firm with a view to erecting a ground wood mill in Arnprior. A year ago Mr. Gordon C. Edwards stated to your correspondent that his company had under consideration a possible future extension of its scope to include the manufacture of pulp and paper and it is possible that this may be the outcome.

Members of the McLachlin firm will not discuss the two offers referred to but Mr. Dan McLachlin, head of the firm, admits that the latter has itself had under consideration the matter of going into the pulp and paper business. In discussing the matter he pointed out that there was sufficient pulpwood in the McLachlin limits—in which much of the biggest timber has been cut but the pulpwood left practically untouched—to supply raw material almost indefinitely for a 100 ton mechanical pulp mill. He stated, however, that a mill such as the firm had in mind would mean an expenditure of half a million dollars, one on which the firm hesitated to embark at such an unpropitious time as the present.

Four annual conventions at all of which lumber and pulp and paper matters will be discussed, have been aranged to take place on January 18, 19 and 20 next, instead of holding them at different times and in different places as formerly. The Dominion Conservation Commission will meet on January 18 and 19, and with a view to avoid conflicting with the other meetings, will consider forestry matters on the 18th. The Canadian Society of Forest Engineers will hold its annual meeting on the 18th also and this will be attended by the forestry experts of a number of pulp and paper firms who are members of the Society. On the 19th the annual meeting of the Canadian Lumbermen's Association will meet in convention.

Mr. Dennis Noonan, for many years in the employ of the Government on the Gatineau River and consequently well known to the pulp and paper trade in the Ottawa Valley, died last week in his 76th year. Mr. Noonan who was a native of Ireland, had been a resident of this city since 1846 and was consequently one of its oldest inhabitants. For the last fifty-five years he had been in the Government service on the Gatineau and during the last forty years of this time had been boom master so that he had practically grown old with the industry on the Gatineau.

Heavy falls of snow, accompanied by colder weather, have considerably improved woods conditions which for a time promised to be unfavorable. As a result local pulp and paper firms which do their own cutting have during the past week been rushing the work and it is expected that the amount of pulpwood cut in this district this season, whether directly by the companies or by the farmers for the companies, will be about the same as last year.

Correspondence

Shawinigan Falls, Que., Dec. 9, 1915.

The Pulp and Paper Magazine of Canada,
Toronto, Ont.

Gentlemen:

Referring to your issue No. 23, Dec. 1, pertaining to Discussion on Technical Education.

Your report thereon is erroneous. The Technical Institue in Shawinigan Falls was originally constructed by Mr. Alfred, President of the Shawinigan Water & Power Co., personnally, not by the Company.

Also part of the annual operating expenses is contributed by most of the manufacturing industries of Shawinigan Falls.

Regarding statement of 60% illiteracy, this applies to the working men in general of Shawinigan Falls, i.e. the boys and men together ,and not to the boys only, it is worded in your discussion.

Yours truly,
J. STADLER.

J. Stadler,
Shawinigan Falls, P.Q.

CANADA'S TIMBER SUPPLY

According to R. H. Campbell, Director of the Dominion Forestry Branch, Canada's present supply of commercial timber has been variously estimated to be between five hundred and seven hundred billion feet, board measure, and to cover an area of approximately 170,000,000 acres. This estimate of quantity and area refers only to timber of commercial value as saw-timber. It does not include pulpwood, firewood, tie and pole material nor small timber of any description, although this has undoubtedly a very large commercial value.

The Commission of Conservation is engaged upon an investigation of the forest resources of Canada, which, when completed, will furnish the basis for a more accurate estimate of the amount of timber in the various sections of the country, than has previously been practicable.

NEW PAPER SUBSTITUTE

A new textile paper substitute, competing with cotton, wool, hemp, and jute products is to be made to be made in Germany in increasing quantities at the machine works of Fred. Emil Jagenberg, Düsseldorf. It is especially used for replacing bags, and is termed "Sackolin". Made from paper yarn of a light and soft texture, its suppleness is said to facilitate the lacing of the bags and the repairing of injured spots.

THREE IMPORTANT MEETINGS.

This winter a special attempt will be made to stimulate public interest in matters pertaining to forestry and lumbering by holding various annual meetings at Ottawa during consecutive days. The annual meeting of the Commission of Conservation, at which all aspects of the situation affecting the natural resources of Canada will be considered, will convene on Tuesday, January 18th and 19th. To avoid conflicting with the annual meeting of the Canadian Lumbermen's Association, Wednesday, January 19th, forestry problems will receive special attention on the first day of the meeting.

The Canadian Society of Forest Engineers, the membership of which is made up of men engaged in professional forestry work throughout Canada, will hold its annual meeting Tuesday evening, January 18th. Thursday, January 20th, is the date set for the annual meeting of the Canadian Forestry Association, whose publicity campaign has done so much to forward the interts of forestry in all parts of the Dominion. Separate programmes will be prepared for each meeting, having particular reference to the problems confronting the respective organizations. A special effort will be made to work along the lines of co-operation, since the fundamental interests of forestry and lumbering are identical.

It is expected that as a result of holding these meetings conjointly, a much better attendance will be secured and greater interest manifested than would be possible under the previons plan of holding the various meetings at different times.

FOREST PRODUCTS LABORATORY.

Some good work has been done at Madison in connection with paper and pulp investigations. It is interesting to notice that a great deal of attention has been given to fundamental differences in Soda, Sulphate and Sulphite processes, determining exactly the variation of quality due to differences in the conditions of treatment. Attemps have also been successfully made in the manufacture of Kraft papers from waste pine stumps. The investigations at present under consideration are — Classification of commercial pulps, Effect of mechanical treatment of chemical pulps, etc.—Paper Makers' Monthly Journal.

FORESTRY MAN MADE CAPTAIN

M. Alan E. Parlow, who left the employ of the Dominion Government while working in the Forestry Branch in British Columbia, has been appointed a Captain in the 19th London Regiment. He is a graduate of the University of Toronto. He enlisted as a private. Last December he was made a sub-Lieutenant, and in June was made a full Lieutenant. In September he was appointed Adjutant.

FORESTRY SCHOOL IN CHINA

Experiments by a British expert of reforesting some of the hills of China have led to the establishment of a comprehensive course in forestry in a university in that country.

GERMANY'S BREAKFAST FOOD.

It will be time enough to talk of a food shortage when Germany has eaten up the Black Forest.—New York Sun.

GRADUATE STUDENTS AT THE UNIVERSITY OF MAINE.

R. Sitarama Rao of Bangalore, India registered recently as a graduate student in pulp and paper work at the University of Maine, Orano. He is a graduate of Bombay in Chemistry and Geology. His particular interest is in the use of bamboo, which is indigenous to his country.

Experiments have shown that with proper treatment a good paper can be made from bamboo pulp. In fact the Chinese used it some twenty centuries ago. The paper now made in India is made mostly from "paper grass" and is of such high quality that it brings about 75 cents a pound. Most of the news and other papers are imported. A commercially successful process for using bamboo would give the country a source of cheap paper and would lead to the cultivation of the bamboo as a crop.

Although the population of India is about 300 millions, more than that the whole North American continent, there are said to be only seven paper mills in the country. This may be in part due to the great scarcity of coal. The rivers that might be thought of as furnishing water power are very largely used for irrigation.

Mr. Sitarama Rao is a good student and speaks very entertainingly of India and of Hindoo customs. He is sent here by his Governement to study his specialty.

Mr. Albert D. Conley, a graduate of the University of Maine and Mr. Adrian A. A. St. Marie, a graduate in Forestry of the University of Minnesota are also doing advanced work on pulp and paper problems.

WORLD'S OLDEST NEWSPAPER.

In China in 1895 there were only 19 native newspapers. Today the are nearly 3,000. But though the number of newspapers in China has until late years been very limited, the empire has always been able to boast that it possesss the oldest newspaper in the world, the Kin-Bo, or Metropolitan Reporter, usually termed the Peking Gazette, which has appeared regularly for more than 1,000 years. It is published with the special object of supplying the people with news as to the acts of government, imperial decrees, reports from provincial governors-general, promotions and removals in the Government service, the results of official examinations and the like. It is published and managed by the Board of War in the Chinese capital.

SOCIETY OF CHEMICAL INDUSTRY.

The Society of Chemical Industry Canadian Section held its second meeting in Montreal this session on Friday the 10th instant.

A paper on "The Utilization of Waste Sulphite Lees" was read by Mr. James Beveridge and one on "Household Ammonia" by Professor J. F. Snell.

AN EMBARGO ON LOGWOOD

Great Britain has placed an embargo on logwood from Jamaica. This seriously affects dye industry as because of lack of German dyes there has been a great demand for old vegetable dyes. From logwood are obtained black, blues and browns. Logwood has advanced from $17.50 to $35 a ton and there is talk of $50 and $75.

PAPER FROM STRAW

Another effort is to be made at Winona, Wisconsin, to make paper from straw.

ORIGIN OF WOOD PULP PAPER.

A writer in the "Newcastle Chronicle" says that an old hornet's nest caused Dr. Hill, of Augusta, Maine, to make the discovery. A friend and neighbour had told him there was not enough cotton and rags in the world to supply the newspapers and other publications with their raw material. That was about forty years ago, and Dr. Hill took a hornet's nest to the superintendent of a near by paper factory and asked him, "Why can't yau make paper like that?" They sat down together, took the nest apart, analysed it carefully, and decided that if a hornet could make paper out of wood, man ought to be able to do as much The doctor discovered that the hornet first chewed the wood into a fine pulp. They decided to make machinery and water do what the hornet's mouth did. Such was the beginning of the wood pulp industry.

CANADIAN WALL-PAPAR AND THE BRITISH MARKET.

Opportunities for Canadian manufacturers of wall-paper to sell their products in Great-Britain are dealt with in a report to the Canadian Trade and Commerce Department by Mr. Dyer, Commissioner at Leeds. Canadian manufacturers are invited to send samples and prices as the present is considered a favourable time to open up a new market. In the three years previous to the war German wall-paper manufacturers sent on an average 42,000 cwts. of paper-hangings each year to the United Kingdom, while even Belgian manufacturers sent 12,000 cwts. per annum.

There has been incorporated in the United States the Cleveland Pyraform Bottle Co., with a capital of $150,000. Paper milk bottles and other similar receptacles will be made under a patent granted to Mr. W. L. Poffenbarger. The principal features of the new milk bottle are that it is made of a heavy weight waxed paper, paraffin coated, is conical in shape, with the upper end about half the size of the lower. This makes it impossible for the bottle to tip over when filled. The vertical edges of the paper are fastened with a metal strip, and a similar strip is used to seal the top.

SWEDISH METHODS.

In Scandinavian paper mills, newsprint paper has been made for a long time from old newspapers and long fiber hot ground mechanical pulp. "Aside from this," says Paul Ebbinghaus, "years ago I made from 80 percent mechanical pulp, 15 percent old books and a suitable quantity of loading substance—consequently without cellulose or rag pulp—fine white paper. The old books were boiled with weak soda lye; washed and bleached. The pulp could hardly be distinguished from bleached rag whole stuff.

THE TERRY TURBINE.

"The Terry Turbine" is the title of a new bulletin just issued by The Terry Steam Turbine Co., Hartford, Conn., giving a general description of the various turbine applications, and dealing particularly with various kinds of high, low and mixed pressure turbines.

A BUSINESS CHANCE.

Mr. James Beveridge has sold his interest in the Beveridge Paper Company to Mr. James Home. The business will continue in Montreal under the same name as heretofore.

FORMER EDITOR DISAPPEARS.

Mr. F. Page Wilson, a former editor of the Pulp and Paper Magazine is missing according to reports sent out from Toronto. About three years ago Mr. Wilson disposed of his interests in the Pulp and Paper Magazine and in the Biggar-Wilson publishing house and went to Florida where he engaged in fruiet farming. While at work on his farm last August he received a severe blow on the head from a falling cocoanut and a few days later left for a neighboring town ,since when nothing has been heard of him. As he had expressed a desire to serve in France and was a veteran of the war in Cuba, it is thught he may now be in the trenches. The police officials and every institution in the Southern States, have been calcularized, and the War Office has been asked to aid. Mrs. Wilson is in Toronto seeking the aid of the police.

Mr. Wilson was a well-known writer. At one time he was assistant editor of the Monetary Times and later editorial writer on the Canadian Engineer and other publications.

SWEDISH EMBARGO.

The Swedish Government has issued an order prohibiting the export of redwood and white wood in an unworked state. A petition was presented by the Swedish Paper Manufacturers' Union setting forth that on account of the extraordinary difficulty of obtaining anthracite coal and such like fuel in sufficient quantities many paper mills are compelled to make use of wood in order to continue working, and that even wood fuel is now being bought up as far as possible for pulp wood and pit props for export; further, that Norway, whose needs were formerly supplied from Russia, has been a large consumer. The petition stated that if this state of affairs continued paper mills in Sweden would be compelled to shut down owing to the absence of raw material. The government, on the argument brought forward, acceded to the paper makers' request.

TO PLANT TREES IN SCHOOL GROUNDS

At the annual meeting of the Pomological and Fruit Growing Society of the Province of Quebec held at Macdonald College a few days ago Principal Harrison made an interisting announcement. In the course of his address Dr. Harrison dealt with the school house problem, pointing out the neglected state of the average school house lot, and explained the plans that had been made to rectify this in part during the coming spring and summer. While the College could not hope to beautify all the school lots in the Province, they hoped to do so in the more travelled districts, and at other spots, so as to make centres which would influence others. In additions to sending out a graduate to attend to this work, it was propose dto start the College to grow suitable trees and plants.

PAPER EXPORTS

Exports of paper through the port of New York during the week ending December 1 consisted of shipments having a total valuation of $181,084, which were forwarded to thirty-three different countries. Some of the largest shipments were as follows: To Argentina, $44,665; to England, $38,491; to Australia, $18,110; to Jamaica, $12,728; to Mexico, $9,390, and to France, $8,315. — Paper Mill.

The Forests of Japan

The forestry situation in Japan is interestingly described, in a recent interview, by A. Nakai, a district forester from Tokio, who has been making a trip through portions of the United States, studying the administration of forests areas by federal and state governments.

"The total forest area of Japan, including Honshu, Shikoku, Kyushu, the Luchu islands and other smaller islands, is 56,820,000 acres. The forests cover 78.3 per cent of the total area of the Japanese islands. Of the 10,000,000 of forests in the principal islands of the group, two-thirds is in standing timber and the remainder is being reforested. The forests are classified into state, crown and private areas and the timber is chiefly cedar, spruce, birch and Japanese pine, which is similar in appearance to the red and white pine of the United States and Canada, but of different physical characteristics. It requires about 100 years for forest trees to attain a diameter of 14 to 15 inches at a point about five feet above the ground surface.

"Japan exports more timber products than it imports. Corea and parts of China and Europe, Australia and the United Kingdom consume most of the lumber exported, although the United States takes large quantities of our oak. The large timbers used in Japan come from the Pacific Northwest.

"Conservation methods work successfully in Japan and complete reforesting of denuded areas can be accomplished in from 80 to 100 years. Reforesting was commenced in Japan about 30 years ago and the system is now complete.

"Patrol methods are followed in protecting Japanese forests from destruction by fire, a ranger's district covering from 5,000 to 6,000 acres. Volunteers fight the fires. When areas are cleared for reforesting, lines of about 40 yards in width are left open and kept clear to prevent the spread of fires. In Japan there are seven major forest districts and within these are 205 subdivisions, all under comprehensive control. Areas may be cleared for farming, but in Japan the farm units are small, averaging only three acres for each farm.

"Taking the timbered areas of Japan, including the southern portion of Sakhalien, which is 90 per cent. timbered. Formosa and Korea into consideration, it will be observed that Japan has a very large forest area, estimated at 54,000,000 acres in her colonies of Sakhalien, Formosa and Korea."

JAPAN'S IMPORTS OF PULP.

There was a slight increase over the preceding year in the Japanese imports of pulp for paper making. Less than 3 per cent of such pulp comes from the United States, the chief source of supply being Sweden. Printing paper is imported chiefly from Great Britain, packing paper from Sweden, and imitation Japanese paper from Sweden and Norway. This last-named paper showed a decrease over the preceding year, as it is unable to compete with the paper made in Japan.

SHIPMENTS FROM SWEDEN.

Shipments from Gothenberg, Sweden, to the United States of bleached chemical wood pulp fell from $845,399 during the first half of 1914 to $488,934 for the first half of 1915; unbleached chemical wood pulp, however, increased from $185,814 to $257,999.

The Reforestation Movement in China

By W. F. Sherfesee (in the American Forestry), Director of Forestry, Philippine Islands.

China has long been held up as the horrible example of forest neglect. Her treeless hillsides have proved the text for many a lecture, and her floods have served to illustrate many a warning. The casual traveler, by river boat or railroad, in describing his impressions, has seldom failed to refer to the treelessness of the areas through which his route lay; and the technical forester and the conservation propagandist have joined the tourist in deprecating the negligence in the past which has deprived the present-day Chinese of one of the most essential elements of industrial civilization. In most cases such accounts have not been exaggerations, for although there are said still to be found large areas of forest in more or less good condition, particularly in Manchuria, it is undoubtedly true that throughout most portions of the country the treeless mountains rise naked from the treeless plains.

That such a situation as this has had and continues to have a disastrous effect upon the industrial productiveness of the country, as well as upon the comfort and well-being of its inhabitants cannot be doubted. Mr. Gifford Pinchot writes that—"Of the two basic materials of our civlvization, wood and iron, the forest supplies one. The dominant place of the forest in our national economy is well illustrated by the fact that no article whatsoever, whether of use or ornament, whether it be for food, shelter, clothing, convenience, protection, or decoration, can be produced and delivered to the user, as industry is now organized, without the help of the forest in supplying wood. An examination of the history of any article, including the production of the raw material, and its manufacture, transportation and distribution, will at once make this point clear."

The magnitude of the task in China, the appalling amount of work which should be done, need not prevent a beginning being made, if only on a small scale, for while flood prevention and to a lesser extent the fixation of wind-blown earth require for best success that operations should be undertaken and carried through on a large scale, the most pressing need of all—that of raising a cheap and abundant supply of fuel and timber—can be taken up on any scale, large or small, according to the available means.

Through the energy, perseverance and skill of Prof. Joseph Bailie, cordially and actively supported by influential Chinese and by the University of Nanking, an admirable beginning has already been made on the slopes of Purple Mountain, just outside the walls of Nanking, and a School of Forestry has been opened at Nanking. There is every reason to expect that a high degree of success will continue to attend these efforts and that they will, as they should, serve as an object lesson and as an encouragement for the inauguration and wide extension of similar projects.

SPANSH RIVER PULP.

Announcement is made in the Ontario Gazette that the Spanish River Pulp & Paper Co., Limited, has given notice of its intention to surrender its charter.

PAPER PLANT SOLD.

Eastern Manufacturing Co. of South Brewer, Me., has bought plant and timber holdings of Katahdin Pulp & Paper Co. at Lincoln for $570,000. Property has been practically controlled through purchase of stock for some time.

PULITZER SCHOOL OF JOURNALISM MAKES GOOD.

Since the opening of the Pulitzer School of Journalism, which was founded three years ago at Columbia University by the late Joseph Pulitzer, it has been in entirely successful operation and takes its place, as the leading school of journalism in the country, accordingto Dr. Nicholas Murray Butler, president of the university, in his report. He adds that the success of the school is a matter of common knowledge.

In view of these facts, Dr. Butler states that it is to be assumed that the executors of the will of Mr. Pulitzer will now feel warranted, under the terms of the testament, to turn over to the school the whole principal set apart for it, or $1,000,000, which is in addition to the $1,000,000 turned over to Columbia University by Mr. Pulitzer.

TREE ON TREE.

A singular tree in Cuba is called the yaguey-tree. It begins to grow at the top of another tree. The seed is carried by a bird, of wafted by the wind, and, falling into some moist, branching part, takes root and speedily begins to grow. It sends a kind of thin, stringlike root down the body of the tree, which is soon followed by others. In course of time these rootings strike the ground, and growth immediately commences upwards. New rootings continue to be formed and get strength until the one tree grows as a net round the other. The outside one surrounds and presses the inner, strangling its life and augmenting its own power. At length the tree within is killed, and the parasite that has taken possession becomes itself the tree.

FORESTS FALL IN WAR.

The havoc of the European war in regard to forests is described as being "without precedent in history." Trees are being cut down out of face for trenches and to make roads, for firewood, and to permit the more effective use of artillery. Projectiles and forest fires are also doing much damage. Indeed, in many places woods have been completely destroyed.

QUEBEC ASSOCIATED PRESS.

At their annual meeting the members of the Quebec Associated Press elected the following officers: President, Damase Potvin; first vice-president, Philippe Desjardines; second vice-president, Amadee Gagnon; secretary-treasurer, J. E. A. Pin; directors, Lorenzo Labreeque, Alonzo Cinq-Mars, Joseph Barnard, Raoul Renault and J. A. Davis.

BIG PAPER MACHINE FOR BELGO-CANADIAN ARRIVES

The Belgo-Canadian Pulp and Paper Company, of Shawinigan Falls, has at last received the big paper machine which was on order in England previous to the outbreak of war. This is one of the largest machines in the country. It is now being installed and will be in operation in February.

THE FREIGHT CONGESTION.

Paper consumers, jobbers and dealers in New York City are complaining of the difficulty in securing supplies of paper because of the glut of freight that has tied up all the great trunk lines coverging in that city.

BRITISH PAPER MILLS IN WAR TIME.

Probably never in the history of papermaking have British paper mills had to face so many difficulties as they are up against today, says our London contemporary, *The Paper-Maker and British Paper Trade Journal.* Scarcity of labor, increasing pulp prices, dear coal, extraordinarily high freights, insurances, and unparallelled delays, all combine to increase paper mill proprietors' and managers' anxieties, and many paper mills are not at all anxious to enter into contracts even at present prices for any long period ahead. Newspaper proprietors and publishers are themselves very hard hit, but it cannot be said that good "news" delivered at 1⅜d. net is an exorbitant figure today, everything considered. Certain consumers have taken large risks in the belief and the hope that the market would turn in their favor. They have been mistaken, and even at present prices many paper mills are actually losing money.

ENGLAND PLACES AN EMBARGGO ON LOGWOOD.

The foreign trade advisor of the United States state department confirmed the rumor that the English authorities had declared an embargo on the export of logwood from Jamaica to other countries than England. They state that they have taken the matter up with the British government but will know nothing definite for several days. In addition to this it is understood that the English are holding several logwood shipments in South American ports bound for the United States on the ground that they are German owned. Inasmuch as logwood has been used as a substitute in a great many instances since the embargo on dyestuffs from Germany, this may mean a still more serious dyestuff situation.

GOVERNMENT CO-OPERATION.

The heavy orders for lumber for the United Kingdom placed through the Provincial Government during the past summer as a result of the visit of Lumber Commissioner MacMillan to Europe, show what results can be obtained by Governmental action in assisting the lumbering industry. In order to follow up the advantage already gained in this new line of work the Hon. W. R. Ross announces that the Provincial Government is sending a business representative of the industry to London.

Mr. J. G. Woods, the well-known lumberman, has been appointed as the new Lumber Commissioner to the United Kingdom. Mr. Woods has been long and intimately connected with the lumber business of the Coast.

REAL ECONOMY.

Wooden spills in the place of matches, penny wooden penholders instead of quills so dear to British officialdom, and a few envelopes and odd sheets of notepaper instead of unlimited supplies, gave a surprise a few days ago to members of the British Parliament, who are accustomed to utilize the House of Parliament as a club.

In reply to angry protests the attendants explained this was the first step in the direction of national economy demanded so urgently in recent speeches of the House of Commns.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

George H. Parks, a vice-president of the International Paper Company, which has its offices at 30 Broad Street, New York City, has recently resigned his position. Mr. Parks has been succeeded by Allen Curtis, manager of the Department of Manufacture. The resignation of Mr. Parks marks the termination of a career with the "I. P." which dates back to the founding of the company. With the exception of a few years spent in the employ of the Great Northern Company, George H. Parks has been with the International ever since.

So great has the congestion of traffic become in the East, especially at the Port of New York, that the railroads may have to declare a general embargo to bring about a normal condition. It seems that the volume of the tonnage destined to this section for shipment to Europe is far greater than the available ships necessary to receive it. Hence it has been necessary to allow the cars to remain on sidings loaded, thereby using up exta cars and making so much less to be had for the use of the shippers. Already some of the railroads have issued embargoes on certain commodities. A committee, appointed by the carriers, is meeting daily in New York City to devise ways and means to avoid any posible complications.

Nothing new has yet developed in the investigation of the "box board trust" which is being made in Philadelphia, Pa., by U. S. District Attorney Francis Fisher Kane. It is understood that this investigation is the result of a complaint made at Washington, D. C. because of the sharp and general advance in prices on boards of all kinds during the past month or more.

The stockholders of the Riverview Coated Paper Company, Kalamazoo, Mich., have voted $400 000 for the erection of a paper mill. Preparation of the plans will be started at once so that work can be commencod on construction at the earliest possible date. The advisability of building a coating plant is being considered by the Kalamazoo Paper Company, also of Kalamazoo. The Riverview Coated Paper Company has, in the past, purchased its paper from the Kalamazoo Paper Company.

An important complaint has been filed with the Maine Public Utilities Commission, by a number of Maine paper and pulp manufacturers, alleging unjust rates on pulpwood moved by the Bangor and Aroostook and Maine Central railroads. Among the allegations are that the rates from Northern Maine Junction to Dover and Foxcroft are too high; that rates from Millinocket are lower than granted to destinations; that the rates are higher than those of other roads for pulpwood for similar distances The complaints also claim that the rates are so high that they find it difficult and almost impossible to obtain pulpwood incompetition with consumers at Millinocket, at Dolby Rips and East Millinocket.

Decision has been made by the Green Bay Barker Company, of Green Bay, Wis., to build an extensive addition to its plant, install new machinery and to add to its lines or barkers.

Shipment to Japan was made during the past week by the J. J. Plank Company, of Appleton, Wis., of two dandy rolls.

The Jeffrey Manufacturing Company, of Columbus, Ohio, has just opened a new branch office at Milwaukee, Wis., in the M. & M. Building. A. Q. Dufour has been placed in charge of the office.

Much surprise was felt in paper making circles by the recent announcement of the marriage of G. H. P. Gould, of Lyons Falls, N. Y., president of the St. Regis Paper Company, to Mrs. Ella Trevor Lennox of Lowville, N. Y. Mr. Gould had just passed his seventieth year.

W. T. Libbey has just assumed the position of superintendent of the three mills of the Remington Paper and Power Company, and will make his headquarters at Norfolk, N. Y. Mr. Libbey was formerly connectet with the Montague mill of the International Paper Company, at Turner's Falls, Mass., and is now occupying the office recently held by J. P. Riley, the new assistant to President Dodge, of the "I. P."

A recent decision handed down by the Official Classification Comittee of New York, classifying wiping rags as "Waste cotton N. O. S. In uncompressed bales, or bags, sacks or cases L. C. L., second class. In compressed bales L. C. L., fourth class. In C. L. minimum carload weight 20,000 lbs., subject to rule 27, fifth class", is considered somewhat of a victory for the rag dealers who were fighting the efforts of the railroads to bring the classification up to a regular first class description.

The Aaron Peters Laboratories, of Pittston, Pa., has changed its firm name to the Lehigh Paper Mills, Inc. The Lehigh Paper Mills, Inc., manufacture a line of Li-Ka-Kloth and sanitary paper products; antitarnish kraft hand rolls and paper diapers.

Notice has been received by the parties implied in the protest of the Mechanical and Chemical Pulp Division of the American Paper and Pulp Association against the practice of allowing free storage to imports of pulps at the ports of Newport News, Norfolk, Va., and Baltimore, Md., that the case has been indefinitely postponed by the Interstate Commerce Commission. The Commission has so many cases on hand that it may not be able to reach this case till late in January. From advices received so far, it appears that the various paper manufacturers, also members of the American Paper and Pulp Asociation, will fight vigorously the ap-

proval of any such protest made by the Mechanical and Chemical Pulp Division.

Fred. Burbank, who recently as a manager of the specialties department of the International Paper Company, New York City, has just purchased an interest in the firm of Critchely & White, in that city.

Many prominent manufacturers were present at the recent meeting of the Writing Paper Manufacturers Association, at Dayton, Ohio. The color problem occupied most of the attention during the sessions. A program, arranged by the local committee, included an inspection trip of the National Cash Register Plant, which was thoroughly enjoyed and appreciated by all.

Kurt Wandel, for many years general manager of the Wandel Screen Manufacturing Company, of East Walpole, Mass., has become affiliated with the Cameron Machine Company and has his office with the concern at 61 Poplar Street, Brooklyn, N. Y.

Confirmation has been received of the sale of the sulphite mill of the Battle Island Paper Company, at Fulton, N.Y., by Judge Ray, at the court house in Auburn, a few weeks ago.

The business of the Norwich Paper Mills, Inc., of Norwich, Conn., has been placed in the hands of a receiver, in order to protect the interests of its creditors. The following extract, from a notice sent to the creditors, fully explans the situation: Our difficulties are due primarly to insufficient working capital together with other contributing causes

At the annual meeting of the United Paperboard Company, of New York City, held recently in Jersey City, N. J., all of the officers and directors were reelected. The company has experienced a remarkable improvement in business during the past few months and is very hopeful regarding the future.

George R. Beach, of Jersey City, N. J. has been appointed receiver of the Jersey City Paper Company, on the application of Ralph H. Perry, a note holder. The assets of the company are placed at $113,534, and liabilities at $167,826.

The Mead Pulp and Paper Company, of Chillicothe, Ohio, has just authorized the issue of $450,000 special preferred 7% stock, payable quarterly, to follow the present $350,000 autstanding 6%, preferred stock, and $150,000 of common stock to be added to the present $500,000 of common stock. The new preferred stock is cumulative, payable quarterly and may not be retired within five years, except on the payment of a bonus of $15 per share. It is expected that the plant at Chillicothe will be repaired to make it operate at double its present capacity.

ADMITTED INTO RUSSIA.

Paper pulp prepared by chemical process (cellulose, pulp made from rags, straw, peat, etc.) is now added to the list of goods, which, on importation into Russia, need not be accompanied by a certificate of origin.

Forest Fire Protection in New York

According to Mr. Spencer Kellogg, of Utica, the state of New York has the best forest fire protective system on this continent. While on a recent visit to Canada he described the system.

"New York State," said Mr. Kellogg, "has the best forest fire protection on the American Continent. We work on a good system with a solid basis."

Mr. Kellogg went on to say that special men were appointed for lookout duty, one for the daytime and the other at night. These men occupy lookout houses built 60 feet above one of their highest mountains.

On this turret, as it might be called, was a large reflecting glass, showing the whole expanse of that district. It is connected by telephone to the nearest station. These lookout men get $60 or $75 per month.

"There is a fire warden, who in case of a fire has a right to order everybody out, with the exception of doctors, ministers, telephone operators and a few others. Even a bank president would have to turn out.

"All the men are paid $1.50 per day, along with their food, while the fire continues. The pay is small, but the reason for that is so no person who perhaps is out of work, will start a fire, in order to earn a day's pay. Previously they were paid $2 and $2.50 per day.

"If the fire happened to start along a railway track, where it very often commences, the warden can order a special fire train, at the expense of the railway company on whose line it began. On the other hand if it did not start on the track, the warden could still order the train, at the expense of the State."

CHINESE-SPANISH ORANGE TREES.

By judicious grafting on trees of Chinese origin Spanish fruit growers have been able to produce trees that bear oranges of better quality and which are productive for 300 years.

RECORD PAPER CARGO.

When the British steamer Werribee left Vancouver for Australia via Port Angeles, she carried the biggest single shipment of paper that ever left the paper mills at Powel River. The cargo consisted of 3,000 tons of paper, which was made up of 10,500 rolls. From here the Werribee shifted to Port Angeles to take on a deckload of lumber for the Antipodes.

FLY PAPER.

Orville Wright at a dinner in Dayton, said he was well pleased with the progress of aviation in America.

"All the same," he added, "I don't think the time has yet come that, when you go into a shop and ask for fly paper, the shopkeeper will answer:

"Yes, sir, and which do you prefer, The Aeranautical Weekly or the Aviation Daily News?"—New York World.

AUTO TIRES FROM PAPER.

Paper automobile tires, made experimentally in Europe, seem to have the strength of metal and the resiliency of rubber.

Lead pencils, of which the world produces 2,000,000,000 a year, are a great tax on certain varieties of wood, of which the best for this purpose are Rocky Mountain cedar, sequoia, Pt. Orford cedar, redwood and alligator juniper.

PULP AND PAPER NEWS

PULP AND PAPER NEWS.

(Pulp and Paper Magazine).

One of the oldest paper box makers in Toronto passed away recently in the person of Joseph H. Harrison, who, for twenty-one years, was manager of the paper box department of Robertson Bros, Limited. Mr. Harrison, who was born in Manchester, England, came to Canada when a young man and was for some time engaged in business for himself. He was fifty years of age and leaves a wife, four sons and two daughters.

Many friends in the paper trade will sympathize with A. T. Wilgress, King's Printer for Ontario and late publisher of the Brockville Times who received a cablegram recently, stating that his only son, Lieut. G. K. Wilgress of No. 1 Co, 21st Batallion, had been killed in action in France. The young soldier was only twenty one years old.

William Gorman, who has for some time been associated with C. deWolf Reid, the Montreal representative of the Provincial Papers Mills Co. has succeeded the latter who has resigned and left last week for Buenos Aires, Argentine Republic.

A federal charter has been granted to the Indian Lake Lumber Co. Limited, with headquarters in Winnipeg and a capital stock of $100,000, to deal in timber lands and limits, own and operate saw mills and to build booms, dams, timber slides, etc.

The agreement entered into between the Colonial Lumber and Pulp Co. and George F. and John A. Whalen for the development of the Colonial Company's property has been upheld by the courts in British Columbia and the company has been restrained into another agreement with Lester W. David. An agreement made some time ago called for Whalen Bros. to pay $50,000 fees to the British Colonial Columbia government float a two million dollar bond issue, and proceed within a year on the erection of a large pulp mill on the company's leases at Quatsino Sound. Delay ensued in starting work on the mill within the year, for which Whalen Bros. claimed they were entitled to an extension of time The Colonial Co. had, however, entered into, a new agreement with several Seattle men through Lester W. David. By the judgment of the courts the Whalen covenant is held to be still subsisting.

The opinion of the Ontario Railway Board in the appeal of the Roman Catholic Separate schools in Fort Frances, Ont. against the apportionment of the assessment of the Ontario and Minnesota Power Co. has been issued. The Board holds that the public schools are entitled to the full assessment, sustaining the judgment of the Court of Revision, which was confirmed also by the district judge. The company had apportioned one half of its assessment to the Roman Catholic Separate Schools. The notice was served too late in 1914, and the assessor refused to act on it in 1915 contending that it was invalidated by proceedings before the courts. The proportion of Roman Catholic among the shareholders of the Ontario and Minnesota Power Co. was not proved, and the Railway Board dismissed the appeal of the Separate School trustees without costs, The appeal of the Ontario and Minnesota Power Co., who operate a news print mill of 150 tons capacity and also a ground wood plant of 100 tons output at Fort Frances, against the company's assessment in that town was dismissed by the Ontario Railway Board in a judgment recently handed out. The assessment stands at $1,200,280.

The Bennett Lumber Co., Limited with a capital stock of $50,000 and headquarters in Montreal, has been granted a federal charter. The company is empowered to manufacture, sell and deal in lumber and timber as well as timber limits and timber lands, and to generate electric and other power.

The exhibits of British Columbia woods which were recently sent to Australia are being shown at the Royal Exchange, Sydney, and will also be featured at the approaching architectural exhibition. Many trade inquiries have been received. So many orders for lumber for the United Kingdom have come to the British Columbia government as the result of the visit of Lumber Commissioner MacMillan to Europe, that J. G. Woods a widely known lumberman of the province, has been appointed a special lumber commissioner to England. He has a thorough practical knowledge of all branches in the industry whose interests he will further in the European market.

The Powell River Pulp and Paper Co. of Powell River, B.C. are making heavy shipments of newsprint to Australia and New Zealand. The British steamer, Werribee recently left Powell River with three thousand tons of news in her holds consisting of 10,500 rolls. This is the heaviest shipment of paper ever made from a western port.

F. H Russell who, some years ago, was manager of sales for the Laurentide Co. and is now identified with the Burgess Co. manufacturers of flying machines at Marblehead, Mass., recently spent a few days in Toronto as the guest of I. H. Weldon President of the Canadian Pulp and Paper Association and called upon a number of old friends in the trade. Mr. Russell lately visited the flying schools in England and was in London during one of the Zeppelin raids. A bomb was dropped from an altitude of seven thousand feet and fell on a vacant house in Hamstead. Writing to Mr. Weldon on his return to Marblehead Mr. Russell sent a photograph of the bomb, saying that the thermit contained therein ran off on the cement floor of the basement of the house luckily without harm and without injury to the bomb. This is the only bomb in private possession, and Mr. Russell thinks it would prove of great interest to the people of Toronto. He suggests that it be rented to some business firm in Toronto and displayed with a suitable easel for holding a recruiting poster. The proceeds from the rental would be devoted to comforts for the boys at the front and to welfare work among the troops stationed on the

Isle of Shepey. The troops assigned there are the King's Royal corps which regiment used to be the 16th Royal Americans in the days of the French and Indian wars. In the picture showing the murderous weapon are the following words on a poster, "A Zeppelin incendiary bomb drop from a Zeppelin somewhere in London", Sept. 8, 1915. It is far better to face the bullets than to be killed at home by a bomb, Join the army at once and help to stop an air raid. God Save the King."

An extension will be erected to the plant of the Interlake Tissue Mills at Merritton, Ont., which will be one hundred feet long and three storeys high, built of brick, steel and concrete. Work will shortly be started on the addition which will be completed by May next. The finishing and specialty departments will be removed to the extra space. This move is made in preparation to installing a second machine, a Harper Fourdrinier, which will result in doubling the output of toilet, tissue, crepe specialties and light wrapping papers. The plans have already been approved. The Interlake Tissue Mills have been operated only two years and are rushed with business working to the utmost limit to keep up with orders George Carruthers is the President of the Company.

The appeal entered by Hughes against the Publishers Association, of Toronto, in an action to recover $5,000 damages for the death of E. C. Filton alleged to have been caused by the negligence of the defendants, has been dismissed.

At a recent meeting of the Graphite Arts Board of Trade, Toronto, the policy was adopted that such of the married men, who are in the employment of the members and enlist for foreign service, will be none the worse financially when they are serving in the militia. That is, the members will add their army pay to what their families secure from the Patriotic Fund and so make up the difference to the full pay that the employees were receiving when they enlisted; and that both married and single men are assured of their positions when they return An agreement to so protect and encourage the men, who have given up their positions at the call of the Empire, is being forwarded to Toronto printers, bookbinders and electrotypers to sign and return to Daniel Baker, manager of the Graphic Arts Board of Trade.

The Ontario Gazette contains a notice that the Spanish River Pulp and Paper Co., Limited, intends to surrender its charter. This is being done to avoid confusion and misunderstanding as the correct name of the present operating company is the Spanish River Pulp and Paper Mills, Limited.

Fire broke out a few days ago in the plant of Miller Bros. Co., Limited, which located at Glen Miller in Hastings country, and did serious damage. The company manufacture straw and wool pulp board and straw and wood board eggs fillers. While the equipment consists of four beating and two Jordan engines, and one, 72 inch cylinder machine. It is understood that the egg filler end of the business will not be interrupted but that it will be a couple months before orders can be accepted for straw and wood pulp board. New equipment is now on hand and the plant will be put in running order again as speedily as possible.

International Paper Co.

International Paper, like all newsprint producers, has not benefited by the war. Instead the war has created certain special hardships such as curtailment of dye supplies, loss of certain imported clays and has embarrassed to some extent the importation of pulp or pulp-wood from Canada.

So far as demand for newsprint is concerned the war has had the effect of slowing down advertising and hence the size of newspapers. To constant readers of metropolitan papers this has not always seemed to be the case and it is less true now than back in the first four or five months of the year. At the same time domestic demand is still 10 per cent below normal.

It is encouraging to know, however, that International Paper is shipping more paper than three months ago, and October shipments are better than September.

One satisfactory result this year will be the continued whittling down of floating debt. The company has had a floating debt for so long and it remained stationary for so long that it seemed at one time like a permanent feature. On Dec. 31, 1914, last is amounted to $5,450,000. Two years before it stood at $5,818,000. This year the total will be chopped down by over $1,000,000 to say under $4,500,000.

This is the most emphatic step in the right direction that the company as made so far as floating debt is concerned. It means that now that the depreciation charge has been held at the $1,000,000 per annum level for three years, it is possible to devote other surplus earnings to cutting down bank loans. This works both ways. It improves the company's credit and it reduces the annual interest charge by a substantial amount.

International Paper is steadily moving forward in the way of increased economy of operation. Two of its important mills are being equipped to burn oil instead of coal. It is confidently believed that the saving which this will effect when applied to the company's entire plant system will amount to a fairly sizable sum as measured against the preferred stock.

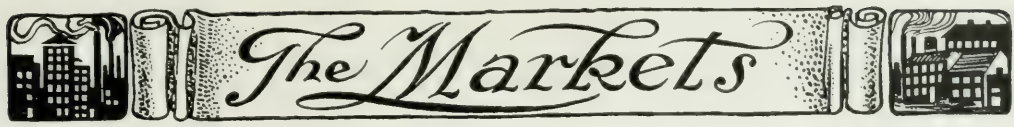
If general business improves and the newspapers of the United States resume their general habit of making money, International Paper will be quick to catch the step. It is a line for larger gross and when it comes it will mean more in the way of expanding net than at any time since the corporation was formed.

Despite some decrease in domestic demand International Paper's net earnings for 1915 are keeping abreast of results for the 12 months ended Dec. 31 last. This would mean a balance of close to 5 per cent for the $22,400.000 preferred against 2 per cent paid in dividends, if the full year bears out the promise of the first nine months.

BRITISH COLUMBIA LUMBER SAMPLES.

With commendable initiative and enterprise, the Forest Department of the Province of British Columbia recently forwarded three separate exhibits of forest products to the Canadian Trade Commissioner (Mr. D. H. Ross) at Melbourne for exhibition in Australia. One set has been installed in the office of the Trade Commissioner in the Stock Exchange Building at Melbourne—and another set has been placed in the assembly hall of the Royal Exchange at Sydney, N.S.W.

The third set will probably be shown at Adelaide, South Australia, when space in a suitable building can be arranged.



CANADIAN MARKETS

The news print market is humming and mills are all busy running to capacity. Many foreign orders have had to be refused owing to local demand and contracts entered into with large United States publishers. Prices are firm and if the present activity keeps up, as it is expected that it will, values will strengthen at the first of the year. Book, writing and bond plants are partly well employed, and in wrappings and kraft papers there has been a substantial advance. This is due to the export trade in kraft, exceptionally high figures prevailing abroad. The ascendancy in quotations for sulphite and sulphate pulp has also much to do with the recent appreciation in values. The increase in kraft paper is from one half to three quarters of a cent per pound while sulphate pulp is now quoted at $47 per ton.

It is understood that a meeting of the wrapping paper manufacturers was recently held, at which the following schedule of prices to jobbers was agreed upon in car load lots, net thirty days—fibre $3.35; manila No. 1, $3.35; Manila No. 2, $3; B manila $2.50; grey browns $2.50. The advances range all the way from fifteen cents to thirty cents per hundred, or an average uplift of three to six dollars for manila per ton and $5 to $7 on fibres, while the kraft increases are from $12 to $16 per ton.

The color situation is getting more difficult every day and prices for deep dyed stock are now a matter of arrangement between mills and customers. Unbleached sulphite pulp is selling at $46 and, in some cases very high grade stock brings $50. What the figure will reach by the end of the year is hard to prophesy. Paper manufacturers are beginning to feel and realize the seriousness of the situation and are vainly endeavoring to make contracts but mills are holding aloof. Scandinavian concerns are asking prohibitive prices in America as they can dispose of all their product in Europe.

Toilet, tissue and specially mills are all rushed to capacity and unable to meet all orders. Papers bags in sympathy with the raise in manila and kraft are likely to jump at the commencement of 1916 while bristols, poster and cover papers will assume a sharp advance. Many Canadian mills are now turning out new lines one plant recently putting on the market linen finish and crash cover papers, while another is making onion skin and manifolding papers. A leading American firm have notified Canadian patrons that they have withdrawn prices on glassine papers as their product is sold up for some months in advance. One Canadian mill, which went into the production of glassine and greaseproof papers this spring, is doing a splendid business and has exported cargoes to Japan and other countries. It is expected that, before another year rolls around, vegetable parchment papers will be made in Canada. Thus foreign papers in this and other lines, which came in in large quantities before the war, will be excluded.

The paper trade in Canada has expanded in many ways as a result of the strife in Europe while the additional war tax of seven and a half per cent has shut out considerable competition. Some eight million dollars worth of various brands of paper were imported in the Dominion before the war and this sum is now being spent among Canadian industries in the paper line who are rising to the occasion.

The market for ground wood is also improving in sympathy with activity in paper circles and renewed business vitality as high as seventeen dollars is being obtained at the mills by some firms. Jobbers report that trade has been a little quiet during the past few days owing to the stiff advances, but consumers will son become accustomed to the new exactions and purchase freely as stocks are low and the future is uncertain owing to the precariousness of the sulphite situation.

Coating paper plants are well employed and some inquiries have been received for export but, owing to transportation difficulties, it is not likely that any mills will undertake fresh obligations. Makers of envelope and papetries are doing a splendid trade and Christmas demands always result in several new productions being put on the market. This year there is no exception and those packets and pads of a patriotic character have the largest call.

In chemicals, mills are finding that casein is steadily going up while bleaching powder, china clay, satin white and other lines are decidedly stiff. Rag and paper stock conditions are lively and prices in every line are mounting. There is a pronounced shortage in domestic rags and shipments from abroad have shown little improvement. Board mills are busy and paper box factories are rushed to a greater extent than for months past. On all grades of waste papers, quotations show a steady advance.

Quotations f.o.b. Toronto, are:—

Paper.

News (rolls), $1.95 to $2.00 at mill, in carload lots.
News (sheets), $2.10 to $2.15 at mill, in carload lots.
Book papers (ton lots), 4.25c. up.
Book papers (carload), No. 3, 4.00c to 4.25c.
Book papers (carload), No. 2, 4.50c.
Book papers (ton lots), No. 2, 4.75c to 5.50c.
Book papers (carload) No. 1, 5.00c to 5.50c.
Book papers (ton lots), No. 1, 5.50c up.
Sulphite bonds, 7 to 8c.
Writings, 4½c up.
Grey Browns, $2.50 to $2.75.
Fibre, $3.35 to $4.00.
Manila, B., $2.75 to $3.50.
Manila No. 1, $3.35 to $4.00.
Manila, No. 2, $3.25 to $3.75.
Unglazed Kraft, $4.50 to $5.25.
Glazed Kraft, $4.75 to $5.50.

Pulp.

Ground wood pulp (at mill), $15 to $17.
Ground wood $19 to $23, delivered.

Sulphite (unbleached), $45 to $50, del. in Canada.
Sulphite ((unbleached), $46 to $50, delivered in U.S.
Sulphite (bleached) delivered, $62 to $70.
Sulphate, delivered, $47 to $48.

Paper Stock.

No. 1 hard shavings, $2.25.
No. 1 soft white shavings, $1.75.
White blanks, $1.00.
No. 1 book stock, $1.00.
No. 2 book stock, 60c.
Ordinary ledger stock, $1.25.
Heavy ledger stock, $1.65.
No. 1 Manila envelope cuttings, $1.05.
No. 1 print Manilas, 60c.
Folded News, 45c.
Over issues, 50c.
No. 1 cleaned mixed paper, 37c.
Old white cotton, $2.40.
No. 1 white shirt cuttings, $5.25.
Black overall cuttings, $1.60.
Thirds, blues, $1.60.
Black linings, $1.60.
New light flannelettes, $3.75.
Ordinary satinets, $1.70.
Flock, $1.80.
Tailor rags, $1.70.
Blue overall cuttings, $3.75.
Manila rope, $2.65.
No. 1 burlap bagging, $1.35.

Quotations f.o.b. Montreal remain unchanged, and are as follows:

Book—News—Writing and Posters.

Roll News, $40 to $43 per ton for large orders; $45, to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 5¾c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.
Writing Manila, 5c.
Colored Posters, 4½c to 5¼c per lb.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manila, car lots, 2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manila, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manila, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $39 to $40 per ton.
Bleached sulphite, $54 to $59 per ton.
Ground wood, $20 to $23, delivered in United States.
Kraft Pulp, $39 to $40.

NEW YORK MARKETS.

(Special to Pulp and Paper Magazine).

New York, December 12, 1915.

Considerable improvement has been noted during the past few weeks in the market for ground wood pulp. The cold spell which has enveloped northern New York has frozen many of the rivers in that section and has thereby deprived the news mills of power to operate their grinding machines. As the news plants are practically all running at full capacity and are grinding large quantities of ground wood, it was not long before the grinders began to experience a material increase in demand for stock. The market has stiffened in proportion and prospects are fairly bright—more encouraging than they have been in many months. The inquiry for export continues especially from France and it is this which is helping to bring about a betterment in conditions.

Chemical pulps have not deviated from their skyward course. The general conditions have become very acute, which, together with an increasing demand for stocks makes it appear that the coming winter will be an exceedingly hard one for those who have not contracts for pulp. The increase in the cost of manufacture has been remarkable and seems to continue without cessation. The raw materials necessary have become very expensive and are practically prohibitive in price when considered for making pulp. From Scandinavia advices have been received stating that a number of mills have been laboring under difficulties because of the advanced costs of raw materials, and have, in some cases, been compelled to curtail their products. A number of others have found it impossible to secure sulphur and they found it necessary to shut down. On the whole it is stated that the production of Scandinavian pulp has been reduced considerably during the past few months. For this output, a market unusually large has been opened to the foreign producers.

Germany, which formerly made its own pulp and supplied the rest of the world with large quantities, is one of the most eager buyers in the Scandinavian market. It is understood that the Germans are offering prices much higher than those prevailing in this country and are endeavoring in every way possible to get possession of as much pulp as they can. England, is in great need of pulp as in France, and practically the rest of Europe. The result has been that our market has been entirely ignored. Importers state that they thought it absolutely impossible to contract for shipment of stock at present. In a few cases they have been able to negotiate for limited quantities of pulp to be shipped in the near future at very high figures. That paper makers realize the predicament in which they will most likely be during the winter, seems evident from the steadily growing enquiry for pulp now current. Stocks on our docks have been practically exhausted. Domestic producers have contracted for the sale of their stock during the largest part of the coming year. Bleached sulphite has been without doubt affected more seriously than any of the other chemical pulps. The quotations on bleached paper have now reached a 6c market. Even at this figure it seems impossible to obtain supplies in any quantity. Dealers in bleached paper report having sold their

production ahead, and state that the market is absolutely bought up. Already several of the bleached sulphite mills have been unable to continue operation because of their inability to get supplies of bleaching powder. The future for this particular product seems very precarious and it is very likely that a famine will be experienced. Importers do not hesitate to predict that 6c will be asked for bleached sulphite before long. Kraft pulp is also unusually hard to obtain. No imports have been received of krafts. The domestic makers are sold out and there is little available on the docks. It is understood that a good part of the Canadian output is being sent to England, thus reducing the quantity which might be obtained by paper manufacturers in this country. Prices on krafts have advanced considerably and indications are that they will continue to do so. Bleached sulphite is in good demand and advancing. Easy bleaching has sprung in to prominence because of the bleached sulphite situation. Many paper makers have tried to resort to the use of easy bleaching in the absence of bleached sulphite. However, there is a general scarcity of easy bleaching and quotations are reaching unprecedented heights. Sulphates are in good demand and are going up. The closing of navigation in the Baltic Sea will shut out a large part of the contract shipments which can come to this country.

The rag market is firm and prices are maintaining a fairly high level. Roofing stock which has been very active and which was the original cause for the upward movement of the market has eased up considerably. It was said a short time ago that the paper manufacturers were in receipt of heavy orders from abroad and that these orders would most likely keep their plants busy throughout the winter and thus tide the rag market over its usual dull season. However, the easing of the demand for roofing rags seems to bear out the statement of various of the large manufacturers that they had not added very much to their export trade and would therefore not be likely to be in the market for stock during the winter. Just now, most of the roofing plants are well supplied with stock. However, the wild buying of roofing stock during the past few months has created a shortage of the grades commonly used by the writing manufacturers and the other markets of high grade papers. In their scramble to get rags, the roofing men went to the extent of buying up two thirds and Blues, and soiled whites thereby making so much less available for the writing manufacturers.

Bagging is in very good demand and is advancing steadily. The inquiry for all grades is active, not only in paper making industry but also in many others which tend to make the upward movement very much more acute. Stocks are not very plentiful and prospects for securing any large quantities are considered far from encouraging. Manila rope is also active and going higher. Waste papers have shown an inclination to advance within the past week or so. The board mills are running at full capacity and they are using up large quantities of paper stock. Mixed news papers have improved considerably; krafts are somewhat scarce and in fair demand. Shavings of all kinds are moving well and slight betterment has been noted in ledgers and book.

A remarkable improvement has been noted in the demand for paper during the past few weeks. In practically every grade there has been a decided increase in the volume of business. Until now the mills making all sorts of papers, are running at full capacity, and in many cases with orders to keep them going for many weeks. Prices have strengthened materially on account of the increase in the cost of manufacture. Raw materials such as pulp, rags and various chemicals have all gone up tremendously. Many of the vital factors which are necessary in the making of paper, cannot be secured, and in such cases, the advances have been very sharp, anticipating a curtailing of production. Colors continue ascending. It is a known fact that anyone with any quantity of colors on hand can practically get whatever prices he cares to ask. Just at this season when the paper industry has begun to participate in a pronounced prosperity movement, the freight question has become a matter of a great disturbance. It appears that the roads running into the Eastern parts have been filled with products of every sort being sent East for shipment abroad. As the facilities for ocean transportation have been and still are somewhat limited, it has been impossible to unload the cars promptly and as a result, a great number of cars which would ordinarily be used in regular service, are now on sides being practically used for storage purposes, until ships can be obtained. So congested has the freight traffic become that the railroads at meetings held during the past week, have been considering a question of issuing a general embargo on freight coming into New York. Already the Pennsylvania Railroad and the Delaware, Lackawanna & Western and the Baltimore & Ohio, have placed embargoes on various commodities. Should a general embargo be issued, it would cause much annoyance and affect business very much.

Newsprint is in very good demand and is maintaining a fairly high level for prices. Manufacturers report a good demand for export and are of the opinion that the market will maintain its present standing for some time. Tissues are very firm and in some cases exceedingly high. Many of the mills are operating with orders on hand to keep them going through March, which has necessitated their refusing business, and consequently withdrawing quotations. Manilas are firm and advancing, partly due to the very high prices being asked for krafts. Fibres are very active. Krafts are being quoted as high as 4c. Paper bags have shown a little increase during the past week. Boards continue very brisk. Book papers are moving well and are tending to become better.

The following quotations are purely nominal:—

Pulps.

Ground Wood, No. 1, $16 to $17, delivered.
Ground Wood, No. 2, $14.50 to $15.50, delivered.
Unbleached Sulphite, dom., 2.20c to 2.75c, delivered.
Easy Bleaching, impt., 2.40 to 2.85c ex-dock, N.Y.
Unbleached Sulphite, impt., 2.25 to 2.50c., delivered.
Bleached Sulphite, domestic, 2.95 to 3.15c., delivered.
Bleached Sulphite, impt., 3.60 to 4.25c., ex-dock, N.Y.
Unbleached Sulphite, impt., 2.15 to 2.50c., ex-dock, New York.
Bleached Sulphate, impt., 2.80c to 2.90c, ex-dock, N.Y.
Kraft Pulp, 2.30 to 2.50c.
Manila, wood, 2.50 to 3.35c., delivered.
Kraft, No. 1, (dom.) 3.75 to 3.85c., f.o.b. New York
Kraft, No. 2, (dom.) 3.45 to 3.60c., f.o.b. New York.
Kraft, imported, 3.95c to 4c, ex dock, New York.
Boxboards, news, $29.00 per ton, delivered.

Wood pulp board, $40 to $42.50 per ton, delivered.
Boxboards, straw, $27.00 per ton, delivered.
Boxboards, chip, $29.00 per ton, delivered.
Tissue, fourdrinier, 50c. f.o.b. New York.
Tissue, white, cylinder, 42½c to 45c., f.o.b. New York.

Paper.

News, Rolls, transient business, $2.10 to $2.15, f.o.b.
News, Sheets, $2.20 to $2.35, f.o.b.
News, Rolls, contract renewals, $2.00 to $2.10, f.o.b.
News, side runs, $2.00 to $2.05, f.o.b.
Book papers, car lots, S. & S.C., $44.00 to $44.50, f.o.b.
Writing paper, extra superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, superfine, 11c to 13c, del. east Miss R.
Writing paper, No. 1, fine, 9c, del east Miss. River.
Writing paper, No. 2, fine, 8c del. east Miss River.
Writing paper, engine sized, 5c to 8c, east Miss. R.
Bond paper, 5c to 24c, delivered east of Miss. R.
Ledger paper,5c to 25c, delivered east of Miss. R.
Linen paper, 8c to 18c, delivered east of Miss. River.
Manila jute, 4¾c to 5c, delivered.

WAYAGAMACK ANNUAL MEETING.

The annual meeting of the Wayagamack Pulp and Paper Company will be held February 8th. The company recently changed their fiscal year from June 30th to November 30th. The reason for this change was given that the natural season of the company in the pulpwood business closed in the autumn rather than the spring.

It is reported that the company is finding a steady and profitable demand for its kraft paper, the war having rather a favorable effect than otherwise owing to the cutting off of certain European supplies.

THE FIRST TOWN FOREST.

Fitchburg, Mass., claims to be the first municipality in the United States to have officially set aside under a State law an area which is not connected in any way with its parks or water supply system for the express purpose of growing trees for profit. The action of the city government was taken in accordance with the Town Forest Law—known as the Public Domain Act of 1913—by which cities and towns within the Commonwealth may own, control and operate forests. For this purpose, four tracts aggregating 105 acres in extent, have been set apart to be known and used as a Town Forest. These tracts contain 50, 31, 16 and 8 acres, respectively. About one-fourth of this land is now covered with white pine ranging in age from 20 to 60 years.

WISCONSIN'S NEW FORESTER.

Professor F. B. Moody, for the past two years extension professor in forestry at Cornell, has taken up his new duties as a member of the forest, fish and game commission of the State of Wisconsin. By this action he becomes not only a member of the commission, but the State Forester, succeeding E. M. Griffith, who recently resigned.

Professor Moody went to Cornell from Wisconsin, where he was a member of the State Forestry staff, and it is stated that his thorough familiarity with Wisconsin conditions led to his choice as a member of the Wisconsin commission.

WAR ADVERTISING IN MILLIONS.

(The Paper Dealer.)

How many million dollars the British government has spent in advertising during the first year of the war no expert accountant has yet had the facilities to estimate. It is a safe statement to make, however, that no nation ever spent one-tenth as much on printers' ink in the same period.

Kitchener's army has been raised chiefly by advertising. Full page, half page and smaller advertisements in the papers are almost daily occurrences. The billboards have been covered with the greatest variety of posters any advertiser ever had printed. A collection of these would reveal every play of ingenious appeal advertising experts are capable of inventing. The signs on trams, 'buses and private motor cars increase rather than decrease as the war continues. There are appeals for recruits in prose and verse, in cartoon and suggestive picturing—all dressed as attractively as colored inks and trained advertising men can make them.

The recent big war loan, the largest in the history of governmental borrowings, was the occasion of another tremendous advertising campaign. Even the big advertisers who have contracts for the outside pages of the dailies were pushed into the inside so John Bull could ask Britons to pour their savings into the nation's till. If the public had not become accustomed to Great Britain as a big advertiser because of the proportions of the army recruiting crusade, the dimensions of this campaign of advertising for money would have seemed startling, for in itself it was altogether without precedent among nations before this war.

Now there are signs of a third big advertising movement by Great Britain in its "thrift campaign." Already the posters are urging people to eat less meat, to eat more vegetables, to insist that each loaf of bread weigh two pounds, to report any dealer trying to sell a smaller loaf, and giving similar advice as to economical housekeeping. This third campaign on the part of the empire hitherto regarded as conservative and not given to modern or sensational methods, has not yet reacher the proportions of the other two—the campaign for recruits and the campaign for money—but it is in embryo still.

All the patent medicine and the breakfast food advertisers in the United States must take a back seat compared to the British empire now when the dimensions, cost or character of display advertising are in question. John Bull has become the greatest advertiser on earth.

A LOVER OF TREES.

Charles M. Schwab is having his old homestead, "Immergrun," near Loretto, Pa., moved over tops of trees because he did not wish to have trees cut down nor house destroyed. He recently decided to build a $1,000,000 summer residence on site of old home. "I would not think of cutting down those trees," said Mr. Schwab. "All you have to do," he told his engineers, "is to jack the house over the trees."

PAPER PRICES ADVANCE.

A general advance in the price of paper, affecting particularly colored papers, has been announced to jobbers by American manufacturers. American Writing Paper Co. has raised all its colored products from ½ to 1½ cents a pound.